



Tanya M. Hamilton
Vice President
Harris Nuclear Plant
5413 Shearon Harris Rd
New Hill, NC 27562-9300

919-362-2502

10 CFR 50.90

January 22, 2018
Serial: HNP-18-002

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Shearon Harris Nuclear Power Plant, Unit 1
Docket No. 50-400
Renewed License No. NPF-63

Subject: Response to Request for Additional Information Regarding A License
Amendment Request Proposing Changes to Emergency Diesel Generator
Technical Specifications Surveillance Requirements (CAC No. MF9828)

Ladies and Gentlemen:

By application dated June 5, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17156A216), Duke Energy Progress, LLC (Duke Energy), submitted a license amendment request to change Shearon Harris Nuclear Power Plant, Unit 1 (HNP) Technical Specifications Surveillance Requirements established for the Emergency Diesel Generators (EDGs). The proposed changes would restrict the steady-state voltage and frequency limits for EDG operation to ensure that accident mitigation equipment can perform as designed. The proposed changes would also increase the voltage limit for the EDG full load rejection test.

The Nuclear Regulatory Commission (NRC) staff reviewed the request and determined that additional information is needed to complete their review. Duke Energy provided a response to a request for additional information (RAI) from the NRC per letter dated November 27, 2017 (ADAMS Accession No. ML17331A354). Subsequently, the NRC determined a second RAI is needed in order to complete their review. Duke Energy received this second RAI from the NRC staff through electronic mail on December 7, 2017, with a required response date of January 22, 2018 (ADAMS Accession No. ML17360A013).

Attachment 1 to this letter provides Duke Energy's response to the RAI. In response to the RAI, the proposed TS changes provided in the Duke Energy letter dated June 5, 2017, were updated as described in Attachment 1. Attachment 2 provides a copy of the proposed TS changes.

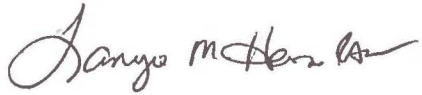
In accordance with 10 CFR 50.91(b), HNP is providing the state of North Carolina with a copy of this response.

This letter does not contain any regulatory commitments.

Should you have any questions regarding this submittal, please contact Jeff Robertson, Manager – Regulatory Affairs, at (919) 362-3137.

I declare under penalty of perjury that the foregoing is true and correct. Executed on January 22, 2018.

Sincerely,

A handwritten signature in black ink, appearing to read "Tanya M. Hamilton". The signature is fluid and cursive, with the first name "Tanya" being the most prominent part.

Tanya M. Hamilton

Attachments:

1. Response to Request for Additional Information
2. Proposed Technical Specification Changes (Markup)

cc: J. Zeiler, NRC Sr. Resident Inspector, HNP
W. L. Cox, III, Section Chief, N.C. DHSR
M. Barillas, NRC Project Manager, HNP
NRC Regional Administrator, Region II

Should you have any questions regarding this submittal, please contact Jeff Robertson, Manager – Regulatory Affairs, at (919) 362-3137.

I declare under penalty of perjury that the foregoing is true and correct. Executed on January , 2018.

Sincerely,

Tanya M. Hamilton

Attachments:

1. Response to Request for Additional Information
2. Proposed Technical Specification Changes (Markup)

cc: J. Zeiler, NRC Sr. Resident Inspector, HNP
W. L. Cox, III, Section Chief, N.C. DHSR
M. Barillas, NRC Project Manager, HNP
NRC Regional Administrator, Region II

U.S. Nuclear Regulatory Commission
Serial HNP-18-002
Attachment 1

SERIAL HNP-18-002

ATTACHMENT 1

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1

DOCKET NO. 50-400

RENEWED LICENSE NUMBER NPF-63

By application dated June 5, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17156A216), Duke Energy Progress, LLC (Duke Energy), submitted a license amendment request (LAR) to change Shearon Harris Nuclear Power Plant, Unit 1 (HNP), Technical Specifications (TS) Surveillance Requirements (SRs) established for the Emergency Diesel Generators (EDGs). The Nuclear Regulatory Commission (NRC) staff reviewed the request and determined that additional information is needed to complete their review. Duke Energy provided a response to a request for additional information (RAI) from the NRC per letter dated November 27, 2017 (ADAMS Accession No. ML17331A354). Subsequently, the NRC determined a second RAI is needed in order to complete their review. Duke Energy received this second RAI from the NRC staff through electronic mail on December 7, 2017, with a required response date of January 22, 2018 (ADAMS Accession No. ML17360A013).

Duke Energy provides the following response to the RAI regarding the LAR. As described in the response, the proposed TS changes provided in the Duke Energy letter dated June 5, 2017, were updated and are provided in Attachment 2. There are no changes to the information provided in the significant hazards consideration within the LAR submitted on June 5, 2017, because of this RAI response.

EEOB RAI 1:

Section 2.0, "Detail Description," of the license amendment request states:

"SR 4.8.1.1.2.f.2 verifies that during shutdown, on a rejection of a load of greater than or equal to 1078 kilowatts (kW), the EDG will maintain a voltage of 6900 ± 690 volts and frequency of 60 ± 6.75 Hz [Hertz], with frequency stabilizing to 60 ± 1.2 Hz within 10 seconds without any safety-related load tripping out or operating in a degraded condition. This SR is being revised to limit the frequency stabilizing value to 60 ± 0.48 Hz within 10 seconds without any safety-related load tripping out or operating in a degraded condition."

The NRC staff notes that the proposed changes to SR 4.8.1.1.2.f.2 only change the frequency values and not the voltage values. SR 4.8.1.1.2.f.2 keeps plus or minus 10% of the nominal voltage (6900 ± 690 volts) instead of the plus or minus 4% of the nominal EDG voltage (6900 ± 276 volts), as proposed in the license amendment request.

Please provide a discussion addressing this discrepancy. In your discussion, provide a summary of the analysis that demonstrates the steady-state voltage values of plus or minus 10% of the nominal voltage (6900 ± 690 volts) is acceptable to SR 4.8.1.1.2.f.2 while only the frequency is changed in the proposed revision to the SR.

HNP Response:

The existing SR 4.8.1.1.2.f.2 currently has a voltage limit of 6900 ± 690 volts for the transient EDG voltage response following a rejection of a load of greater than or equal to 1078 kW. The change proposed to this SR in the LAR was to modify the frequency limit for the steady-state response achieved within 10 seconds. From additional consideration of the change to the EDG steady-state voltage limit and the impact to this SR, which now includes a voltage limit for steady-state conditions, Duke Energy has modified SR 4.8.1.1.2.f.2 to include the 6900 ± 276 volts, as shown in the TS proposed changes (markup) contained in Attachment 2.

U.S. Nuclear Regulatory Commission
Serial: HNP-18-002
Attachment 2

SERIAL HNP-18-002

ATTACHMENT 2

PROPOSED TECHNICAL SPECIFICATION CHANGES (MARKUP)

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1

DOCKET NO. 50-400

RENEWED LICENSE NUMBER NPF-63

ELECTRICAL POWER SYSTEMS

A.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

ACTION (Continued):

- h. With one automatic load sequencer inoperable:
 - 1. Restore the automatic load sequencer to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours and COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.8.1.1.1 Each of the above required physically independent circuits between the offsite transmission network and the onsite Class 1E distribution system shall be:

- a. Determined OPERABLE at the frequency specified in the Surveillance Frequency Control Program by verifying correct breaker alignment and power availability, and
- b. Demonstrated OPERABLE at the frequency specified in the Surveillance Frequency Control Program by manually transferring the onsite Class 1E power supply from the unit auxiliary transformer to the startup auxiliary transformer.

4.8.1.1.2 Each diesel generator shall be demonstrated OPERABLE:

- a. At the frequency specified in the Surveillance Frequency Control Program by:
 - 1. Verifying the fuel level in the day tank,
 - 2. Verifying the fuel level in the main fuel oil storage tank,
 - 3. Verifying the fuel oil transfer pump can be started and transfers fuel from the storage system to the day tank,
 - 4. Verifying the diesel generator can start** and accelerate## to synchronous speed (450 rpm) with generator voltage and frequency 6900 ± 690 volts and 60 ± 1.2 Hz,
 - 5. Verifying the diesel generator is synchronized, gradually loaded** to an indicated 6200-6400 kW*** and operates for at least 60 minutes,
 - 6. Verifying the pressure in at least one air start receiver to be greater than or equal to 190 psig, and
 - 7. Verifying the diesel generator is aligned to provide standby power to the associated emergency buses.

INSERT:
"steady-state"

INSERT: "0.48"

INSERT:
"276"

** This test shall be conducted in accordance with the manufacturer's recommendations regarding engine prelube and warmup procedures, and as applicable, regarding loading recommendations.

*** This band is meant as guidance to avoid routine overloading of the engine. Loads in excess of this band for special testing or momentary variations due to changing bus loads shall not invalidate the test.

The voltage and frequency conditions shall be met within 10 seconds or gradual acceleration to no-load conditions per vendor recommendations will be an acceptable alternative.

ELECTRICAL POWER SYSTEMS

A.C. SOURCES

OPERATING

SURVEILLANCE REQUIREMENTS (CONTINUED)

4.8.1.1.2 (Continued)

- b. Check for and remove accumulated water:
 - 1. From the day tank, at the frequency specified in the Surveillance Frequency Control Program and after each operation of the diesel where the period of operation was greater than 1 hour, and
 - 2. From the main fuel oil storage tank, at the frequency specified in the Surveillance Frequency Control Program .
- c. By verifying fuel oil properties of new and stored fuel oil are tested in accordance with, and maintained within the limits of, the Diesel Fuel Oil Testing Program, at frequencies in accordance with the Diesel Fuel Oil Testing Program.
- d. DELETED.
- e. At the frequency specified in the Surveillance Frequency Control Program, the diesel generators shall be started** and accelerated to at least 450 rpm in less than or equal to 10 seconds. The generator voltage and frequency shall be 6900 ± 690 volts and 60 ± 1.2 Hz in less than or equal to 10 seconds after the start signal.

INSERT: "276"

INSERT: "0.48"

INSERT:
"steady-state"

** This test shall be conducted in accordance with the manufacturer's recommendations regarding engine prelube and warmup procedures, and as applicable regarding loading recommendations.

ELECTRICAL POWER SYSTEMS

A.C. SOURCES

OPERATING

SURVEILLANCE REQUIREMENTS (CONTINUED)

4.8.1.1.2 (Continued)

The generator shall be manually synchronized to its appropriate emergency bus, loaded to an indicated 6200-6400***kW, and operate for at least 60 minutes. The diesel generator shall be started for this test by using one of the following signals on a rotating basis:

1. Simulated loss of offsite power by itself, and
2. A Safety Injection test signal by itself.

This test, if it is performed so that it coincides with the testing required by Surveillance Requirement 4.8.1.1.2.a.4, may also serve to concurrently meet those requirements as well.

f. At the frequency specified in the Surveillance Frequency Control Program by:

1. DELETED
2. During shutdown, verifying that, on rejection of a load of greater than or equal to 1078 kW, the voltage and frequency are maintained with 6900 ± 690 volts and 60 ± 6.75 Hz, with ~~frequency stabilizing to 60 ± 1.2 Hz~~ within 10 seconds without any safety-related load tripping out or operating in a degraded condition.
3. During shutdown, verifying that the load sequencing timer is OPERABLE with the interval between each load block within 10% of its design interval.
4. During shutdown, simulating a loss of offsite power by itself, and:

INSERT: "voltage stabilizing to 6900 ± 276 volts and frequency stabilizing to 60 ± 0.48 Hz"

*** This band is meant as guidance to avoid routine overloading of the engine. Loads in excess of this band for special testing or momentary variations due to changing bus loads shall not invalidate the test.

ELECTRICAL POWER SYSTEMS

A.C. SOURCES

OPERATING

SURVEILLANCE REQUIREMENTS (Continued)

4.8.1.1.2 (Continued)

- a) Verifying de-energization of the emergency buses and load shedding from the emergency buses.
- b) Verifying the diesel starts** on the auto-start signal, energizing the emergency buses with permanently connected loads in less than or equal to 10 seconds, energizing the auto-connected shutdown loads through the load sequencer, and operating for greater than or equal to 5 minutes while its generator is loaded with the emergency loads. After energization of these loads, the steady-state voltage and frequency shall be maintained at 6900 ± 690 volts and 60 ± 1.2 Hz.
5. During shutdown, verifying that on a safety injection test signal (without loss of power) the diesel generator starts on the auto-start signal and operates on standby for greater than or equal to 5 minutes.
6. During shutdown, simulating a loss of offsite power in conjunction with a safety injection test signal, and
 - a) Verifying de-energization of the emergency buses and load shedding from the emergency buses.
 - b) Verifying the diesel starts** on the auto-start signal, energizing the emergency buses with permanently connected loads in less than or equal to 10 seconds, energizing the auto-connected emergency (accident) loads through the sequencing timers, and operating for greater than or equal to 5 minutes and maintaining the steady-state voltage and frequency at 6900 ± 690 volts and 60 ± 1.2 Hz.
 - c) DELETED

INSERT: "0.48"

INSERT: "276"

INSERT: "276"

INSERT: "0.48"

**This test shall be conducted in accordance with the manufacturer's recommendations regarding engine prelube and warmup procedures, and as applicable regarding loading recommendations.

ELECTRICAL POWER SYSTEMS

A.C. SOURCES

OPERATING

SURVEILLANCE REQUIREMENTS (Continued)

4.8.1.1.2 (Continued)

7. Verifying the diesel generator operates** for at least 24 hours. During the first 2 hours of this test, the diesel generator shall be loaded to 6800-7000 kW*** and, during the remaining 22 hours of this test, the diesel generator shall be loaded to an indicated 6200-6400 kW***.
8. DELETED
9. During shutdown, verifying the diesel generator's capability | to:
 - a) Synchronize with the offsite power source while the generator is loaded with its emergency loads upon a simulated restoration of offsite power.
 - b) Transfer its loads to the offsite power source, and
 - c) Proceed through its shutdown sequence.
10. DELETED
11. During shutdown, verifying the generator capability to reject a load of between 6200 and 6400 kW without tripping. |
The generator voltage shall not exceed ~~110% of the generator voltage at the start of the test~~ during and following the load rejection;

INSERT:
"8280 volts"

 →
12. During shutdown, verifying that, with the diesel generator | operating in a test mode and connected to its bus, a simulated Safety Injection signal overrides the test mode by: (1) returning the diesel generator to standby operation and (2) automatically energizing the emergency loads with offsite power.

**This test shall be conducted in accordance with the manufacturer's recommendations regarding engine prelube and warmup procedures, and as applicable regarding loading recommendations.

***This band is meant as guidance to avoid routine overloading of the engine. Loads in excess of this band for special testing or momentary variations due to changing bus loads shall not invalidate the test.

ELECTRICAL POWER SYSTEMS

A.C. SOURCES

OPERATING

SURVEILLANCE REQUIREMENTS (CONTINUED)

4.8.1.1.2 (Continued)

13. During shutdown, verifying that all diesel generator trips, except engine overspeed, loss of generator potential transformer circuits, generator differential, and emergency bus differential are automatically bypassed on a simulated or actual loss of offsite power signal in conjunction with a safety injection signal.

14. During shutdown, verifying that within 5 minutes of shutting down the EDG, after the EDG has operated for at least 2 hours at an indicated load of 6200-6400 kw, the EDG starts and accelerates to 6900 ± 690 volts and 60 ± 1.2 hz in 10 seconds or less.

INSERT:
"0.48"

g. At the frequency specified in the Surveillance Frequency Control Program or after any modifications which could affect diesel generator interdependence by starting** both diesel generators simultaneously, during shutdown, and verifying that both diesel generators accelerate to at least 450 rpm in less than or equal to 10 seconds.

INSERT:
"276"

h. At the frequency specified in the Surveillance Frequency Control Program by:

1) DELETED.

2) Performing a pressure test, of those isolable portions of the diesel fuel oil piping system designed to Section III, subsection ND of the ASME Code, at a test pressure equal to 110% of the system design pressure.

INSERT: "a
steady-state
voltage and
frequency of"

** This test shall be conducted in accordance with the manufacturer's recommendations regarding engine prelube and warmup procedures, and as applicable regarding loading recommendations.