

February 20, 2019

Docket Nos.: 50-321  
50-366

NL-19-0188

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

Edwin I. Hatch Nuclear Plant – Units 1 and 2  
Emergency License Amendment Request for Technical Specification 3.8.1  
Regarding Voltage Limit Increase for  
Emergency Diesel Generator Load Rejection Surveillance Test  
SNC Response to NRC Request for Additional Information

Ladies and Gentlemen:

By letter dated February 19, 2019 (Agencywide Documents Access and Management System Accession No. ML19050A010); Southern Nuclear Operating Company (SNC) submitted an Emergency license amendment request (LAR) for Hatch Nuclear Plant (HNP) Units 1 and Unit 2. The LAR requested approval to revise surveillance requirement (SR) 3.8.1.8 in Technical Specification (TS) 3.8.1, "AC Sources – Operating," to increase the voltage limit in the emergency diesel generator (EDG) full load rejection test for the Unit 2 EDGs and the swing EDG. By email dated February 19, 2019, the NRC staff provided a request for additional information (RAI) to support review of the Emergency LAR.

Enclosure 1 to this letter provides the SNC responses to the NRC request for additional information (RAI). Enclosure 2 to this letter provides revised HNP Unit 1 and 2 TS Marked-up Pages. Enclosure 3 to this letter provides HNP Unit 1 and 2 revised TS Clean Typed Pages.

This letter contains no NRC commitments. If you have any questions, please contact Jamie Coleman at 205.992.6611.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 20th day of February 2019.

Respectfully submitted,

  
C. A. Gayheart  
Regulatory Affairs Director

CAG/kgI/sm

Enclosures:   1. SNC Response to NRC Request for Additional Information (RAI)  
                  2. Revised HNP Unit 1 and 2 Technical Specification Marked-up Pages  
                  3. HNP Unit 1 and 2 Revised Technical Specification Clean Typed Pages

Cc:     Regional Administrator, Region II  
          NRR Project Manager – Hatch  
          Senior Resident Inspector – Hatch  
          Director, Environmental Protection Division – State of Georgia  
          RTYPE: CHA02.004

**Edwin I. Hatch Nuclear Plant – Units 1 and 2**

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**Enclosure 1**

**SNC Response to NRC Request for Additional Information (RAI)**

## **NRC RAI EEOB-1**

Section 2.1, "Emergency Circumstances," of the LAR states:

"It has been evaluated and determined that this increased voltage following a full load rejection was not an anomaly, but rather a result of the higher operating bus voltage due to installation of the new SAT."

Please provide a discussion on the evaluation of the increased voltage and how the new value for the operating bus voltage was calculated.

## **SNC Response to RAI**

The increased ESF bus operating voltage was calculated in a safety-related calculation for the degraded voltage protection modification using ETAP, Version 12.6.0N. The calculated bus operating voltage values were confirmed during the post-modification testing performed for ESF Bus 2F. As stated in the degraded voltage protection LAR the calculated voltage will be confirmed by obtaining field measurements for the other ESF buses during post modification testing.

The increased initial voltage on the 2F 4160-volt bus was due to installation of the new startup auxiliary transformer 2E. The proposed EDG transient voltage limit of 5200 V during a full load rejection test was determined due to evaluation of historical data which showed that there was an 800-volt difference between the initial bus operating voltage and the peak transient voltage. Using the new initial voltage on the Unit 2 ESF buses for the test, the transient voltage expected on diesel generator 2A and 2C during a full load rejection test would be approximately 5100 V. Therefore, a value of 5200 V as the transient limit was chosen for SR 3.8.1.8 to ensure the Unit 2 diesel generators would meet the SR criteria upon completion of the degraded voltage protection modification for Unit 2.

## **NRC RAI EEOB-2**

Section 3, "Technical Evaluation, Generator" of the LAR states, in part:

"Fairbanks Morse has evaluated the generator at the higher voltage and provided concurrence that the DG will not incur mechanical damage or harmful overstresses."

and,

"Fairbanks [Morse], the generator manufacturer, has verified that a transient overshoot voltage of 5200 volts, which may be experienced every 24 months during testing, does not adversely impact the generator and the generator will not experience detrimental effects due to transient voltages up to 5200 V."

Please describe: a) how the higher voltage Fairbanks Morse evaluated and concurred on for the DG was determined; and b) how Fairbanks Morse verified that 5200 volts does not adversely impact the generator (e.g., via an evaluation or test), including vendor documentation/calculations if available.

### **SNC Response to RAI**

- a) Fairbanks Morse provided a letter-dated February 17, 2019, stating that the generators were constructed and subjected to a hi-pot testing at two times the rated voltage plus 1000 volts for one minute (i.e., 9320 V). This is also stated in the first paragraph of the "Generator" section of the enclosure, Section 3, of the HNP Emergency LAR for TS 3.8.1.
- b) The letter provided by Fairbanks Morse stated "...the alternator was constructed and subjected to high pot testing equaling 2 times rated voltage plus 1000 for 1 minute." Based on the vendor input, the increased voltage limit of 5200 V will not adversely impact or damage the EDG since the factory test conditions encompass the voltage expected to be received during the full load rejection test.

### **NRC RAI EEOB-3**

Section 3, "Technical Evaluation, Generator," of the LAR states, in part:

"Fairbanks [Morse], the generator manufacturer, has verified that a transient overshoot voltage of 5200 volts, which may be experienced every 24 months during testing, does not adversely impact the generator and the generator will not experience detrimental effects due to transient voltages up to 5200 V."

It is not clear whether the proposed voltage limit of 5200 V is conservative, and whether this voltage limit has accounted for the voltage meter tolerances/accuracy. Please provide a discussion of whether the revised voltage limit for SR 3.8.1.8 has factored in the voltage meter tolerances/accuracy.

### **SNC Response to RAI**

Currently, the voltage limit of 4800 V for SR 3.8.1.8 does not include voltage meter tolerance or accuracy. The revised limit of 5200 V for SR 3.8.1.8 also does not include voltage meter tolerance or accuracy consistent with the current requirement. The voltage meter accuracy is  $\pm 1.0\%$  of the range. There was no change in the EDG full load rejection test procedure nor in the installed voltage meters since the last SR was performed.

### **NRC RAI EEOB-4**

Section 3, "Technical Evaluation, Cables," of the LAR states:

"The DG control cable is rated at a minimum of 600 V"

It is not clear why the LAR discussed the "minimum" rating of the control cable while addressing the impact of the DG voltage increase. Please explain.

### **SNC Response to RAI**

The control cable has a rating of 600 V. Section 3 of the LAR evaluates that the voltage rating of the control cables is adequate compared to the transient voltage on the control cable. The EDG

control cabling has a rating of 600 V. The LAR discussion indicated that the voltage rating of the control cables was evaluated and determined adequate compared to the maximum transient voltage that the control cables would be subjected to during a load rejection test. The evaluation conservatively evaluated for the impact of a transient voltage of 9320 V at the diesel generator. The maximum resulting voltage that the control cable would experience would be 269 V, which illustrates that there is sufficient margin for a control cable with a rating of 600 V.

### **NRC RAI STSB-1**

Per the Hatch Technical Specifications the definition of OPERABLE/OPERABILITY is:

A system, subsystem, division, component, or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified safety function(s) and when all necessary attendant instrumentation, controls, normal or emergency electrical power, cooling and seal water, lubrication, and other auxiliary equipment that are required for the system, subsystem, division, component, or device to perform its specified safety function(s) are also capable of performing their related support function(s).

Explain how accepting the testing conducted for the Unit 1B swing DG per SR 3.8.1.8 for Unit 2 with an upper limit of 5200V and per SR 3.8.1.8 for Unit 1 with an upper limit of 4800V will confirm OPERABILITY for each unit without calling OPERABILITY into question for the opposite unit.

### **SNC Response to RAI**

Upon further consideration, SNC is revising the proposed TS Surveillance Requirement (SR) 3.8.1.8 to have the same upper limit of 5200 V for the swing EDG 1B specified in both the Unit 1 and the Unit 2 TS. The justification provided in the Technical Evaluation section of the enclosure to the HNP Emergency LAR for TS 3.8.1 is also applicable to the corresponding Unit 1 SR. Revised TS marked-up pages and TS clean typed pages are provided in Enclosures 2 and 3, respectively. Revising the SR 3.8.1.8 to specify the same voltage limit for EDG 1B in both Unit 1 and Unit 2 technical specifications obviates the need for the additional wording in Note 3 of SR 3.8.1.8 or to call into question the operability the EDG 1B for the opposite unit. The proposed change to Note 3 is removed from SR 3.8.1.8, as shown in the revised technical specification pages provided in Enclosures 2 and 3.

### **NRC RAI GEN-1**

Discuss how SNC has evaluated the potential impacts of higher operating ESF voltages on other safety-related components.

### **SNC Response to RAI**

The potential impacts of higher operating ESF voltages on other safety-related components were evaluated as part of the modification package and plant design change during the electrical modification process and determined to be satisfactory prior to commencement of installation of the modification.

The safety-related calculation concluded that all safety-related equipment being evaluated for overvoltage was acceptable. The criteria and methodology for considering overvoltage has not changed.

This Emergency LAR is to address the transient voltage experienced by the diesel generator and related components upon a full load rejection test. The safety-related components associated with the ESF buses are not affected by the transient voltage on the diesel generator as a result of a full load rejection test and therefore are not addressed as part of this Emergency LAR.

The resulting transient voltage on the diesel generator is due to performing the full load rejection test while in parallel with offsite power. This is a simulated test of actual diesel generator loading conditions during an accident with no offsite power. To simulate a full load rejection, the 4160-volt feeder breaker at the safety-related bus is opened. At the time after the breaker has opened, the 4160-volt bus does not experience the peak transient voltage that occurs at the diesel generator.

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**Enclosure 2**

**Revised HNP Unit 1 and 2 Technical Specification Marked-up Pages**



SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.8</p> <p>-----NOTES-----</p> <ol style="list-style-type: none"> <li>1. This Surveillance shall not normally be performed in MODE 1 or 2, except for the swing DG. However, this surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. For the swing DG, this Surveillance shall not be performed in MODE 1 or 2 using the Unit 1 controls. Credit may be taken for unplanned events that satisfy this SR.</li> <li>2. 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.</li> <li>3. For the swing DG, a single test at the specified Frequency will satisfy this Surveillance for both units.</li> </ol> <p>-----</p> <p>Verify each DG operating at a power factor <math>\leq 0.88</math> does not trip and <del>voltage is maintained <math>\leq 4800</math> V</del> during and following a load rejection of <math>\geq 2775</math> kW.</p> <p>the following voltages are</p> <p>:</p> <ol style="list-style-type: none"> <li>a. For DGs 1A and 1C, <math>\leq 4800</math> V; and</li> <li>b. For DGs 2A, 2C, and 1B, <math>\leq 5200</math> V.</li> </ol>	<p>In accordance with the Surveillance Frequency Control Program</p>

(continued)

SURVEILLANCE REQUIREMENTS (continued)

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<p>SR 3.8.1.8</p> <p>-----NOTES-----</p> <ol style="list-style-type: none"> <li>1. This Surveillance shall not normally be performed in MODE 1 or 2, except for the swing DG. However, this surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. For the swing DG, this Surveillance shall not be performed in MODE 1 or 2 using the Unit 2 controls. Credit may be taken for unplanned events that satisfy this SR.</li> <li>2. 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.</li> <li>3. For the swing DG, a single test at the specified Frequency will satisfy this Surveillance for both units.</li> </ol> <p>-----</p> <p>Verify each DG operating at a power factor <math>\leq 0.88</math> does not trip and <del>voltage is maintained <math>\leq 4800</math> V</del> during and following a load rejection of <math>\geq 2775</math> kW.</p>	<p>In accordance with the Surveillance Frequency Control Program</p>

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**Enclosure 3**

**HNP Unit 1 and 2 Revised Technical Specification Clean Typed Pages**

SURVEILLANCE REQUIREMENTS (continued)

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<p>SR 3.8.1.8</p> <p>-----NOTES-----</p> <ol style="list-style-type: none"> <li>1. This Surveillance shall not normally be performed in MODE 1 or 2, except for the swing DG. However, this surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. For the swing DG, this Surveillance shall not be performed in MODE 1 or 2 using the Unit 1 controls. Credit may be taken for unplanned events that satisfy this SR.</li> <li>2. 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.</li> <li>3. For the swing DG, a single test at the specified Frequency will satisfy this Surveillance for both units.</li> </ol> <p>-----</p> <p>Verify each DG operating at a power factor <math>\leq 0.88</math> does not trip and the following voltages are maintained during and following a load rejection of <math>\geq 2775</math> kW:</p> <ol style="list-style-type: none"> <li>a. For DGs 1A and 1C, <math>\leq 4800</math> V; and</li> <li>b. For DGs 2A, 2C, and 1B, <math>\leq 5200</math> V.</li> </ol>	<p>In accordance with the Surveillance Frequency Control Program</p>

(continued)

SURVEILLANCE REQUIREMENTS (continued)

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<p>SR 3.8.1.8</p> <p>-----NOTES-----</p> <ol style="list-style-type: none"> <li>1. This Surveillance shall not normally be performed in MODE 1 or 2, except for the swing DG. However, this surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. For the swing DG, this Surveillance shall not be performed in MODE 1 or 2 using the Unit 2 controls. Credit may be taken for unplanned events that satisfy this SR.</li> <li>2. 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.</li> <li>3. For the swing DG, a single test at the specified Frequency will satisfy this Surveillance for both units.</li> </ol> <p>-----</p> <p>Verify each DG operating at a power factor <math>\leq 0.88</math> does not trip and the following voltages are maintained during and following a load rejection of <math>\geq 2775</math> kW:</p> <ol style="list-style-type: none"> <li>a. For DGs 2A, 2C, and 1B, <math>\leq 5200</math> V; and</li> <li>b. For DGs 1A and 1C, <math>\leq 4800</math> V.</li> </ol>	<p>In accordance with the Surveillance Frequency Control Program</p>

(continued)