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

April 22, 2013

Mr. C. R. Pierce
Regulatory Affairs Director
Southern Nuclear Operating Company, Inc.
P. O. Box 1295, Bin - 038
Birmingham, AL 35201-1295

SUBJECT: EDWIN I. HATCH NUCLEAR PLANT, UNITS 1 AND 2, SUPPLEMENTAL INFORMATION NEEDED FOR ACCEPTANCE OF REQUESTED LICENSING ACTION CONCERNING PLANT RESPONSE TO DEGRADED GRID VOLTAGE (TAC NOS. MF0412 AND MF0413)

Dear Mr. Pierce:

By letter dated December 21, 2012, Southern Nuclear Operating Company (SNC, the licensee) submitted a license amendment request (LAR) that would revise the HNP Facility Operating Licenses to require SNC to implement modifications that will eliminate the need for manual actions as part of the HNP degraded grid voltage protection system. The Nuclear Regulatory Commission staff finds that it needs the additional information identified in the enclosure to support continuation of its review.

The purpose of this letter is to provide the results of the U.S. Nuclear Regulatory Commission (NRC) staff's acceptance review of this LAR. The acceptance review was performed to determine if there is sufficient technical information in scope and depth to allow the NRC staff to continue its detailed technical review. The acceptance review is also intended to identify whether the application has any readily apparent information insufficiencies in its characterization of the regulatory requirements or the licensing basis of the plant.

Consistent with Section 50.90 of Title 10 of the *Code of Federal Regulations* (10 CFR), an amendment to the license must fully describe the changes requested, and following as far as applicable, the form prescribed for original applications. Section 50.34 of 10 CFR addresses the content of technical information required. This section stipulates that the submittal address the design and operating characteristics, unusual or novel design features, and principal safety considerations.

The NRC staff has reviewed your application and concluded that the information delineated in the enclosure to this letter is necessary to enable the staff to make an independent assessment regarding the acceptability of the proposed amendment in terms of regulatory requirements and the protection of public health and safety and the environment.

The NRC staff requests that SNC supplement the application to address the information requested in the enclosure by sixty (60) days from the date of this letter. This will enable the NRC staff to continue its detailed technical review. Should the application be subsequently accepted for review, SNC will be advised of any further information needed to support the staff's detailed technical review by separate correspondence.

The information requested and the associated timeframe in this letter were discussed with SNC on April 19, 2013.

Sincerely,

Robert Martin

Robert E. Martin, Senior Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-321 and 50-366

Enclosure:
As stated

cc w/encl: Distribution via Listser

SOUTHERN NUCLEAR OPERATING COMPANY

EDWIN I. HATCH NUCLEAR PLANT, UNITS 1 AND 2 (HNP)

By letter dated December 21, 2012, (Agencywide Document Access and Management System (ADAMS) No. ML12356A472), the Southern Nuclear Operating Company (SNC, the licensee) submitted a license amendment request (LAR) for the Edwin I. Hatch Nuclear Plant (HNP), Units 1 and 2. The LAR proposes the addition of a condition to the license as follows: "(10) Degraded Voltage Protection SNC shall implement the Degraded Voltage modifications to eliminate the manual actions in lieu of automatic degraded voltage protection to assure adequate voltage of safety-related equipment during design basis events by completion of the Unit 1, 2020 Spring Outage, U1R29."

The LAR reviewed the history of the issue since the issuance on May 25, 2011, of a NRC Component Design Bases Inspection (CDBI) report regarding the measures in effect at HNP to demonstrate compliance with the applicable provisions of 10 CFR 50.55a(h)(2) and 10 CFR Part 50, Appendix A, General Design Criterion 17 (GDC-17). The LAR also included a proposed project plan, with schedule, for modifications to replace Startup Auxiliary Transformers (SATs), Degraded Voltage Relays (DVRs), and possible replacement of 4160V breakers and switchgears. The NRC staff finds that it needs the following information to support its review.

ELECTRICAL ENGINEERING

SNC's project plan includes proposed modifications to replace SATs, DVRs, and possible replacement of 4160V breakers and switchgears. A summary of the preliminary schedule for implementation of the Degraded Voltage Protection modifications was provided in the Technical Evaluation section of the SNC to NRC letter dated August 9, 2012.

The current licensing basis of Hatch has the degraded voltage protection system relay trip setpoint at 3285 V (78.8 percent of 4.16 kV) with a 21.5 second time delay, and an alarm relay with a setpoint of 3825 V (91.94 percent of 4.16kV). These system setpoints were recognized as a deviation from the guidance on degraded voltage protection provided in NRC generic letter dated June 2, 1977, "Statement of Staff Positions Relative to Emergency Power Systems for Operating Reactors." However, the staff approved the amendment request in an SER dated February 23, 1995. In addition, HNP revised station procedures to maintain a minimum switchyard voltage of 101.3 percent of 230 kV, supported by the software based contingency alarm operated by the transmission system operator.

A proposed schedule for implementation of the Degraded Voltage Protection modifications as provided in the LAR has the following overview of the modification schedule:

2012	May	Planning Starts (in progress)
2013	June	Approve Project Plan
2014	June	Issue Purchase Orders for New SATs
2015	December	Complete Design
2015	December	Submit Technical Specification Amendment Request
2016	January	Receive New SATs
2016	September	Issuance of Technical Specification Amendments

Enclosure

2017	February	2R24 Outage Work -SAT(s), Cabling, Switchgear
2018	February	1 R28 Outage Work -SAT(s), Cabling, Switchgear
2019	February	2R25 Outage Work -SAT(s), Cabling, Switchgear
2020	February	1 R29 Outage Work -SAT(s), Cabling, Switchgear
2020	March	Complete Project Implementation

To support review of the status of the plant during the forthcoming period when these modifications will be implemented, the NRC staff finds that it needs the following information.

1. In the event of ESF actuation during degraded voltage conditions (voltage between the alarm setpoint of 3825 volts (V) and trip setpoint of 3285 V) provide details on:

   a) Equipment/components that may not have adequate voltage to operate;

   b) Equipment that may trip due to automatic protection such as overload relay actuations;

   c) Equipment that may trip but will require manual action to reset the protective device; and,

   d) Equipment that may degrade and may not be able to perform its required function.

2. SNC has previously concluded that raising the undervoltage protection trip setpoint to 91 percent (of 4.16 kV safety buses) would result in little margin between the trip setpoint at which the buses would be separated from offsite power, and the minimum bus voltage that could occur if offsite voltage declined to the lower end of its expected range (101.3 percent of 230 kV). Provide details (magnitude and duration) on the minimum observed voltages at the 230KV level during the last five years.

3. Identify the compensatory actions, onsite and offsite, that will be relied upon to support the proper operation of equipment identified in Question 1 above.

4. The proposed schedule indicates approval of the project plan by June 2013 and issuance of a purchase order for new SATs in June 2014. Explain the delay in issuing the purchase order if the project planning and modification design commenced in May 2012.

5. The design is expected to be complete in December 2015 and the new SATs will be onsite in January 2016. Explain why the modification work for unit one cannot be started in February 2016, during the 1 R27 refueling outage, and completed during the 1 R28 outage.

HUMAN FACTORS

6. Provide:
   a. The titles and procedure numbers of the current procedures that control onsite and offsite manual actions required in response to degraded voltage conditions,

b. Entry conditions for the procedure(s), and

c. A list of the required manual actions in sequence OR provide a copy of the current revision of the relevant procedure(s).

7. For each action listed in RAI number 6 above, identify the cue that alerts the operator that the action is necessary, e.g., annunciator, alarm, alarm typer, plant condition (identify how condition is monitored), step sequence in the relevant procedure, supervisory direction, System Operator notification, or other.

8. Describe the most likely sequence of events that would result from a failure of the System Operator to notify HNP of a degraded voltage condition. What corrective and preventive actions were taken when a similar failure actually occurred on March 14, 1993?

9. Discuss the time required to perform manual actions (onsite and offsite), listed in RAI number 6 above, versus time available before equipment damage occurs.

10. Describe any controls or displays needed (onsite and offsite) to respond to degraded voltage conditions.

11. Is the simulator used for operator training on degraded voltage events? Has the simulator been used to validate the operators' ability to respond to degraded voltage conditions? How often do operators receive training on degraded voltage events?

12. Has an operating experience (OE) review been done to provide insights regarding the effectiveness of the current manual actions in responding to degraded voltage conditions, including plant-specific condition reports, Licensee Event Reports, INPO reports, and other relevant sources? Provide a summary of any plant-specific operator errors or other relevant OE involving degraded voltage conditions, including corrective and preventive actions taken. The event of March 14, 1993 need not be summarized.

13. The licensee stated in its letter of June 17, 2011, that the use of manual actions to respond to degraded voltage conditions provides the flexibility to avoid unnecessary automatic disconnect from the preferred offsite power source. Is there any empirical evidence in the last five to seven years of operating experience that any unnecessary automatic disconnects have been avoided?

14. If both plants are operational, and the System Operator cannot restore voltage to normal levels, do the units respond independently to degraded voltage conditions, or is coordination between units required? If coordination is required, describe how this is done.

The NRC staff requests that SNC supplement the application to address the information requested in the enclosure by sixty (60) days of the date of this letter. This will enable the NRC staff to continue its detailed technical review. Should the application be subsequently accepted for review, SNC will be advised of any further information needed to support the staff's detailed technical review by separate correspondence.

The information requested and the associated timeframe in this letter were discussed with SNC on April 19, 2013.

Sincerely,

/RA/

Robert E. Martin, Senior Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-321 and 50-366

Enclosure:
As stated

cc w/encl: Distribution via Listserv

DISTRIBUTION:

PUBLIC	LPLII-1 Reading File	RidsNrrDorl Resource
RidsNrrDeEeeb Resource	RidsNrrDraAhpb Resource	RidsNrrLASFigueroa Resource
RidsNrrDorlDpr Resource	RidsNrrDorlLpl2-1 Resource	RidsRg2MailCenter Resource
RidsNrrPMHatch Resource	G. Matharu	R. Martin
G. Lapinsky	RidsAcrsAcnw_MailCTR Resource	

ADAMS Accession No.: ML13085A260 * by email

OFFICE	DORL/LPLII-1/PM	DORL/LPLII-1/LA	DE/EEEB/BC *
NAME	RMartin	SFigueroa	RMathew (A)
DATE	04/19/13	04/19/13	04/03/13
OFFICE	DRA/APHB/BC *	DORL/LPLII-1/BC	DORL/LPLII-1/PM
NAME	UShoop	RPascarelli	RMartin
DATE	04/11/13	04/22/13	04/22/13

OFFICIAL RECORD COPY