Charles R. Pierce
Regulatory Affairs Director

Southern Nuclear Operating Company, Inc.
40 Inverness Center Parkway
Post Office Box 1295
Birmingham, Alabama 35201

Tel 205.992.7872
Fax 205.992.7601

February 28, 2013

SOUTHERN COMPANY

Docket Nos.: 50-348
50-364

NL-13-0264

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

Joseph M. Farley Nuclear Plant
Response to Request for Additional Information Concerning the Allowance for
NEXUS Methodology in the Preparation of the Core Operating Limits Report

Ladies and Gentlemen:

By letter dated August 14, 2012, Southern Nuclear Operating Company (SNC), submitted a license amendment request for the Joseph M. Farley Nuclear Plant (FNP) (ML12227A884). The proposed amendments would revise Technical Specification (TS) 5.6.5, "Core Operating Limits Report (COLR)," to reference and allow use of Westinghouse WCAP-16045-P-A, Addendum 1-A, "Qualification of the NEXUS Nuclear Data Methodology," to determine core operating limits. The U.S. Nuclear Regulatory Commission staff (NRC) issued a Request for Additional Information (RAI) by letter dated January 30, 2013. Enclosure 1 contains the SNC response to RAI questions. Enclosure 2 contains the revised markup of the proposed TS. Enclosure 3 contains the revised clean typed TS.

This letter contains no NRC commitments. If you have any questions, please contact Ken McElroy at (205) 992-7369.

Mr. C. R. Pierce states he is Regulatory Affairs Director of Southern Nuclear Operating Company, is authorized to execute this oath on behalf of Southern Nuclear Operating Company, and to the best of his knowledge and belief, the facts set forth in this letter are true.

Respectfully submitted,

C. R. Pierce

C. R. Pierce
Regulatory Affairs Director

Sworn to and subscribed before me this 28th *day of* February*, 2013.*

Laura L Crumpton
Notary Public

My commission expires: 11-2-2013

CRP/RMJ/lac

Enclosures:
1. Response to Request for Additional Information
2. Revised Markup of Proposed Technical Specifications
3. Revised Clean Typed Technical Specifications

cc: Southern Nuclear Operating Company
Mr. S. E. Kuczynski, Chairman, President & CEO
Mr. D. G. Bost, Executive Vice President & Chief Nuclear Officer
Mr. T. A. Lynch, Vice President – Farley
Mr. B. L. Ivey, Vice President – Regulatory Affairs
Mr. B. J. Adams, Vice President – Fleet Operations
RTYPE: CFA04.054

U. S. Nuclear Regulatory Commission
Mr. V. M. McCree, Regional Administrator
Ms. E. A. Brown, NRR Project Manager - Farley
Mr. P. K. Niebaum, Senior Resident - Farley
Mr. J. R. Sowa, Senior Resident - Farley

Alabama Department of Public Health
Dr. D. E. Williamson, State Health Officer

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Enclosure 1

Response to Request for Additional Information

NRC RAI #1

U.S. Nuclear Regulatory Commission (NRC) Generic Letter (GL) 88-16, "Removal of Cycle-Specific Parameter Limits from Technical Specifications," indicates that it is acceptable for licensees to control reactor physics parameter limits by specifying the calculation methodology. The discussion in the GL refers conceptually to the acceptability of licensee control of such parameters based on the use of a specific methodology.

Examples include:

" ... provided that these changes are determined using an NRC-approved methodology ... "

" ... using the specified methodology ... "

As presently worded, the proposed Technical Specifications (TSs) amendment would permit the Joseph M. Farley Nuclear Plant, Units 1 and 2 (Farley) licensees to choose either of two methods; however, the proposed amendment does not explain how this selection would be made. The proposal creates, in effect, a new, more ambiguous, method in which either previous method may be applied. The NRC staff is unable to determine that this proposal is consistent with GL 88-16 guidance. Please propose a revision to TS 5.6.5 that provides for a single, unambiguous method that describes how TS Limiting Condition for Operation (LCO) 3.9.1 will be determined.

SNC Response to RAI #1

The proposed revision to TS 5.6.5 is provided in Enclosure 2 (markup).

NRC RAI #2

The NRC staff safety evaluation approving WCAP-16045-P-A, Addendum 1-A, "Qualification of the NEXUS Nuclear Data Methodology," states that the scope of the staff review was "limited only to the coupling between PARAGON and ANC." This statement implies that one must use PARAGON in order to implement NEXUS. The PARAGON methodology description is substantially more detailed, and includes descriptions of the numerical techniques that are used to solve the transport equation. Please explain how the NEXUS methodology will be applied, given that the proposed TS revision does not include reference to the PARAGON methodology. If appropriate, propose a revision to TS 5.6.5 that refers to methodologies describing both PARAGON and NEXUS.

SNC Response to RAI #2

The SER for WCAP-16045-P-A, Addendum 1-A states:

> PARAGON is a stand alone neutron transport code based on collision probability techniques and approved for use as a stand alone lattice physics code and as a cross section generation tool for core simulators, such as ANC, for uranium-fueled pressurized water reactors (PWRs). ANC is a core simulator code system which performs calculations based on nuclear data supplied by a code such as PARAGON or PHOENIX-P.
>
> Westinghouse proposes to alter the coupling between PARAGON and ANC using a different methodology than previously approved by the NRC. The NEXUS methodology

is a reparameterization of the PARAGON nuclear data output and a new reconstruction approach within the ANC core simulator code to simplify the use of this code system for design use. The NEXUS methodology provides a linkage between PARAGON and ANC, establishing a new code system, while still using PARAGON. Westinghouse refers to this new methodology as NEXUS/ANC.

Given that the NEXUS methodology uses the PARAGON code, SNC maintains that it is not necessary to explicitly reference PARAGON in Section 5.6.5 of the Farley Technical Specifications. Explicitly listing the PARAGON code would further complicate Section 5.6.5, without providing any additional clarification.

NRC RAI #3

Identify any other core operating limits and safety analyses that will be performed or determined using inputs from the NEXUS methodology, such as a loss of coolant accident (LOCA) or boron concentration limits. In addition, discuss any potential impacts on post-LOCA long term cooling emergency operating procedure timing for boric acid precipitation and the action time for switching to simultaneous injection as well as the potential for return to power following a large break LOCA during early reflood when highly sub-cooled water at its minimum temperature enters the lower portion of the core.

SNC Response to RAI #3

The proposed change does not affect the inputs or method(s) for ensuring core subcriticality, both short and long-term post-LOCA, thereby precluding the potential for return to power following a large-break LOCA. Since neither the post-LOCA boron source concentration nor heat generation are impacted by the proposed change, the current emergency operating procedure timing for boric acid precipitation and the action time for switching to simultaneous injection will continue to remain valid. Core design specific parameters that are verified each cycle to be conservative with respect to the LOCA inputs, such as Fq, FdH, and refueling boron concentration, will continue to be calculated using NRC-approved methods.

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Enclosure 2

Revised Markup of Proposed Technical Specifications

5.6 Reporting Requirements

5.6.5 CORE OPERATING LIMITS REPORT (COLR) (continued)

3a. WCAP-12945-P-A, Volume 1, Revision 2, and Volumes 2 through 5, Revision 1, "Code Qualification Document for Best Estimate LOCA Analysis," March 1998 (W Proprietary).

3b. WCAP-12610-P-A, "Vantage+ Fuel Assembly Reference Core Report," April 1995 (W Proprietary).

(Methodology for LCO 3.2.1 - Heat Flux Hot Channel Factor and LCO 3.4.1-RCS Pressure, Temperature and Flow Departure from Nucleate Boiling Limits.)

3c. WCAP-16009-P-A, "Realistic Large Break LOCA Evaluation Methodology Using Automated Statistical Treatment of Uncertainty Method (ASTRUM)" M.E. Nissley, et al., January 2005 (Proprietary).

4. WCAP-8745-P-A, "Design Bases for the Thermal Overpower ΔT and Thermal Overtemperature ΔT Trip Functions," September 1986 (Westinghouse Proprietary)

(Methodology for Overpower ΔT and Thermal Overtemperature ΔT Trip Functions)

5. WCAP-14750-P-A Revision 1, "RCS Flow Verification Using Elbow Taps at Westinghouse 3-Loop PWRs. (Westinghouse Proprietary)

(Methodology for minimum RCS flow determination using the elbow tap measurement.)

6a. WCAP-11596-P-A, "Qualification of the Phoenix-P/ANC Nuclear Design System for Pressurized Water Reactor Cores," June 1988

Commencing Unit 1 Cycle 26 and Unit 2 Cycle 24, method 6b shall be used in lieu of method 6a.

6b. WCAP-16045-P-A, Addendum 1-A, "Qualification of the NEXUS Nuclear Data Methodology," August 2007.

(Methodology for LCO 3.9.1 - Boron Concentration.)

7. WCAP-11397-P-A "Revised Thermal Design Procedure," April 1989

(Methodology for LCO 2.1.1-Reactor Core Safety Limits, LCO 3.4.1-RCS Pressure, Temperature and Flow Departure from Nucleate Boiling Limits.)

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Enclosure 3

Revised Clean Typed Technical Specifications

5.6 Reporting Requirements

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