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

Joseph M. Farley Nuclear Plant – Units 1 and 2  
Supplement to Response to Request for Additional Information for  
TS 3.3.5 Loss of Power Diesel Generator Start Instrumentation LAR

Ladies and Gentlemen:

By letter dated November 20, 2015 (NL-15-0722, Agencywide Documents Access and Management System (ADAMS) Accession No. ML15324A297), as supplemented by letter dated January 12, 2016 (NL-16-0007, ML16012A457), Southern Nuclear Operating Company (SNC) submitted a license amendment request (LAR) to revise Technical Specification (TS) 3.3.5, "Loss of Power Diesel Generator Start Instrumentation," at Joseph M. Farley Nuclear Plant (FNP), Units 1 and 2 to enable compliance with license conditions for each unit which require elimination of reliance on manual actions as part of the degraded voltage protection scheme.

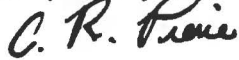
By letter dated March 11, 2016 (ML16060A161), the Nuclear Regulatory Commission (NRC) sent SNC a request for additional information (RAI), to which SNC responded in a letter dated April 11, 2016 (NL-16-0415, ML16117A285). A subsequent telephone discussion between SNC and NRC staff was held on May 18, 2016 to discuss certain RAI response items where additional clarification was needed.

The enclosure to this letter supplements SNC's April 11, 2016 RAI response by providing additional clarifying information as a follow-up to the discussion in the May 18, 2016 phone call.

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

Mr. Pierce states he is Regulatory Affairs Director for 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.

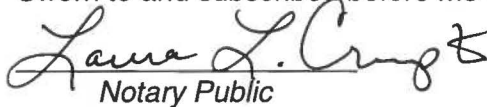
Respectfully submitted,



C. R. Pierce  
Regulatory Affairs Director

CRP/DWD/lac

Sworn to and subscribed before me this 30<sup>th</sup> day of June, 2016.

  
Notary Public

My commission expires: 10-8-2017

Enclosure: Supplement to SNC Response to RAIs

cc: Southern Nuclear Operating Company  
Mr. S. E. Kuczynski, Chairman, President & CEO  
Mr. D. G. Bost, Executive Vice President & Chief Nuclear Officer  
Ms. C. A. Gayheart, Vice President – Farley  
Mr. M. D. Meier, Vice President – Regulatory Affairs  
Mr. D. R. Madison, Vice President – Fleet Operations  
Mr. B. J. Adams, Vice President – Engineering  
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U. S. Nuclear Regulatory Commission

Ms. C. Haney, Regional Administrator  
Mr. S. A. Williams, NRR Project Manager - Farley  
Mr. P. K. Niebaum, Senior Resident Inspector - Farley

State of Alabama

David Walter, Director, Alabama Office of Radiation Control -  
Alabama Department of Public Health

**Joseph M. Farley Nuclear Plant  
Supplement to Response to Request for Additional Information for  
TS 3.3.5 Loss of Power Diesel Generator Start Instrumentation LAR**

**Enclosure**

**Supplement to SNC Response to RAIs**

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This enclosure supplements SNC's April 11, 2016 RAI response NL-16-0415 by providing additional clarifying information as a follow-up to the discussion in the May 18, 2016 phone call relating to RAI items No. 2 and No. 5.

#### **1. RAI No. 2 Supplementary Information Needed**

With respect to RAI Question No. 2, SNC will verify that the same methodology was used to analyze the voltage values for MOVs 3232A, B, and C.

#### **SNC RAI No. 2 Supplementary Response**

With regard to MOVs 3232A, B, and C, the relevant portion of the April 11, 2016 letter NL-16-0415 response to RAI No. 2 stated, in Enclosure 1, item 2.a, that:

"A different methodology is used to analyze the steam generator main feed stop check MOVs Q1N21MOV3232A, Q1N21MOV3232B, and Q1N21MOV3232C, which have adequate voltage to perform their safety function. These MOVs show negative voltage margin in Table 6 of SE-SNC529029-001 for the loss of coolant accident (LOCA) group motor start case with the 4.16 kV Bus 1G prestart voltage at the MRV. However, the methodology used to determine that margin, which matches the methodology of the design basis load studies, is overly conservative."

The same design load basis calculation software methodology used to determine the minimum required terminal voltages for the other loads was used for MOV's 3232A, B, and C. The existing approved (since 1992) methodology used for MOV's 3232A, B, and C differs only in that it includes the additional refinement of modeling the timing of the occurrence of full load and locked rotor current near the end of the approximately 30 second valve stroke duration.

The evaluation concluded MOV's 3232A, B, and C have adequate voltage under existing degraded grid settings to perform the intended function. The minimum required terminal voltage has not changed, so increasing the degraded grid voltage relay settings will add positive margin to the required terminal voltages for these valve operators. The RAI response letter dated April 11, 2016 (NL-16-0415) at Enclosure 1, page E1-4, second paragraph, gives the minimum positive margin as 5.6%.

In conclusion, the same methodology was used for degraded grid evaluations for MOV's 3232A, B, and C as for the other loads evaluated in the design basis calculations. However, while other loads showed acceptable margin even assuming the most severe degraded voltage condition occurred simultaneously with locked rotor current; for MOV's 3232A, B, and C, the dynamic current fluctuations during the valve stroke were credited to verify design margin.

## **2. RAI No. 5 Supplementary Information Needed**

With regard to RAI Question No. 5, the staff asked the licensee to explain how FNP is complying with PSB-1, Position 1.b.1 as it pertains to the need to have two separate time delays. The licensee should explain the function of its design in light of this position including the duration of the first and second time delays, and how the design performs when a safety injection signal is received by the degraded voltage protection scheme.

### **SNC RAI No. 5 Supplementary Response**

NUREG 0800, Appendix 8-A, PSB-1, Position B.1 contains criteria for undervoltage protection for sustained degraded voltage conditions, referred to as a "second level of undervoltage protection" additional to loss of offsite power (LOP), which is the first level. Position B.1.b calls for two time delays for this second level of undervoltage protection. The first time delay is for a degraded voltage alarm in the control room, but B.1.b.1 also calls for immediate separation from offsite power in the event of subsequent occurrence of a safety injection (SI) actuation signal. The second time delay, per Position B.1.b.2, is for automatic separation from offsite power after a duration limited such that Class 1E loads will not be damaged.

At FNP the first time delay (Function 3 in TS Table 3.3.5-1) is implemented by the alarm function of Weschler Model BG252 voltmeters\*, while the second time delay (Function 2 in TS Tables 3.3.5-1 and 3.3.5-2) is separately implemented by the DVRs (currently Type CV-2 induction disc inverse time relays, to be replaced with Type 27N solid state definite time relays). Each BG252 receives an input from its associated train Class 1E bus potential transformer and processes the signal to generate the degraded voltage alarm and provide a voltage display in the control room, but it will not initiate separation of the bus from offsite power upon an SI actuation signal as called for by Position B.1.b.1.

Automatic separation with an SI signal is not needed because the new DVR actuation voltage allowable values proposed in the LAR have been calculated to maintain adequate voltage on the Class 1E buses assuming imposition of SI

loads. The DVR allowable values in TS Table 3.3.5-2 range from 3752 V to 3778 V, well below the 3835 V allowable value for the alarm function in TS Table 3.3.5-1, therefore separating a Class 1E bus from the preferred offsite power source at the alarm setpoint voltage as called for by Position B.1.b.1 is not warranted.

\*Correction to previous information submitted: In the RAI response letter dated April 11, 2016 (NL-16-0415), Enclosure 1, item 5.1.a stated that in the existing protection scheme Type CV-2 induction disc relays are used for the three functions in TS Table 3.3.5-1. This was incorrect. Instead, Type CV-2 relays are used for Functions 1 and 2 (Loss of Voltage and Degraded Grid Voltage Actuation, with the relays for the latter function to be replaced by Type 27N), but for Function 3 (Degraded Grid Voltage Alarm), the Wechsler Model BG252 is used and will continue to be used.

### **3. RAI No. 5 Supplementary Information Needed**

With regards to RAI Question No. 5, the staff asked the licensee to explain how it is complying with PSB-1, Position 1.d, which states, among other things, that TS shall include allowable values for time delays.

#### **SNC RAI No. 5 Supplementary Response**

NUREG 0800, Appendix 8-A, PSB-1 Position B.1.d states:

“The Technical Specifications shall include limiting conditions for operations, surveillance requirements, trip setpoints with minimum and maximum limits, and allowable values for the second-level voltage protection sensors and associated time delay devices.”

The “second-level voltage protection sensors” referred to in Position 1.d correspond to the DVRs which implement Function 2, “4.16 kV Emergency Bus Degraded Voltage Actuation” in both the existing TS Table 3.3.5-1 and the proposed Table 3.3.5-2. In the existing Table 3.3.5-1, Function 2 does not include an allowable value for time delay. However, an allowable value for time delay for each bus is included for Function 2 in the new Table 3.3.5-2 proposed by the LAR.

It is noted that Position B.1.d also calls for trip setpoints, which are not included in the proposed Table 3.3.5-2. Justification for not including trip setpoints was provided in item 5.1.b of the RAI response letter dated April 11, 2016 (NL-16-0415).