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Energy to Serve Your World

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LCV 1359-B

Docket No. 50-424  
50-425

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

Ladies and Gentlemen:

VOGTLE ELECTRIC GENERATING PLANT  
REQUEST TO REVISE TECHNICAL SPECIFICATIONS  
SLAVE RELAY TEST FREQUENCY SURVEILLANCE REQUIREMENT 3.3.2.5

By letter LCV-1359, dated August 24, 1999, Southern Nuclear Operating Company (SNC) submitted a request to extend the slave relay test frequency for Vogtle Electric Generating Plant (VEGP). During a March 3, 2000 teleconference, the NRC requested SNC to answer the four questions found on pages 10 and 11 of the Safety Evaluation performed by the Office on Nuclear Reactor Regulation for WCAP-13878. A copy of this Safety Evaluation is located in the front of WCAP-13878, Revision 2. The four questions and their answers are as follows:

*Question 1: Confirm the applicability of the WCAP-13878 analyses for their plant.*

Answer 1: WCAP-13878 analyzed the reliability of the following Potter & Brumfield (P&B) MDR relays:

- Model 4103-1 non-latching 118 VAC MDR relay
- Model 4121-1 latching 118 VAC MDR relay
- Model 5076-1 non-latching 125 VDC MDR relay
- Model 5134-1 non-latching 48 VDC MDR relay

The VEGP Solid State Protection System (SSPS) utilizes Models 4103-1 and 4121-1 as slave relays.

The VEGP SSPS consists of two redundant trains of a four-bay Westinghouse SSPS (input bay, logic bay, and two output bays). The input, logic and first output bays are virtually identical to Farley's SSPS, where temperature data was collected for WCAP-13878. VEGP

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has an additional output bay. The VEGP P&B MDR relays dissipate about 6.5 watts when energized, substantially less than the Farley AR relays. The temperature rise in the VEGP SSPS cabinets has been verified to be within the assumptions of WCAP-13878.

The VEGP SSPS is located in the Main Control Room (MCR). Technical Specifications require that the VEGP MCR be maintained less than 85° F. In reviewing MCR temperature data, it was determined that the typical MCR temperature ranged from 70° F to 78° F. This is within the temperature assumptions in WCAP-13878.

In summary, the VEGP SSPS utilizes P&B MDR relays identical to those analyzed in WCAP-13878. The environmental conditions in which these relays are located are bounded by the assumptions in WCAP-13878; thus, the analysis and conclusions in WCAP-13878 are applicable to VEGP.

*Question 2: Ensure that their procurement program for P&B relays is adequate for detecting the types of failures that are discussed in References 9, 10, 11 and 12.*

Answer 2: VEGP purchases P&B MDR relays as new, safety related components. No VEGP P&B MDR relays are sent out for rework. Although VEGP does not utilize refurbished or reworked P&B MDR relays, each new P&B MDR relay is inspected for conditions that could indicate sub-standard refurbishment. The specific conditions that are required to be evaluated are identified in Table 11 of procedure 70522-C, "Material Receipt Inspection."

During receipt inspection, new P&B MDR relays will be verified to have been manufactured after 1992. All P&B MDR relays in the warehouse were inspected and any that were manufactured before 1993 were removed from inventory.

*Question 3: Ensure that all pre-1992 P&B MDR relays which are used in either normally energized or a 20% duty cycle have been removed from ESFAS applications.*

Answer 3: VEGP performed a review of the SSPS system and determined that all slave relays that perform technical specification required functions are normally de-energized while the plant is at power. During refueling outages and cold shutdowns the SSPS is normally removed from service; thus, VEGP does not have any ESFAS slave relays that are either normally energized or energized for a 20% duty cycle.

*Question 4: Ensure that the contact loading analysis for P&B MDR relays has been performed to determine the acceptability of these relays.*

Answer 4: VEGP has completed a contact loading study covering each contact on every SSPS slave relay for Unit 1 and found that they are well within the design basis of the slave relays. The Unit 2 SSPS design and loads are similar to unit 1; therefore, a complete contact Unit 2 SSPS contact loading study was not performed. However, a comparison of the

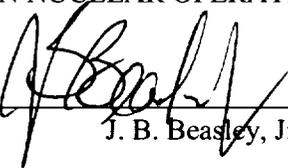
devices actuated by the Unit 1 and Unit 2 SSPS "A" train slave relays was performed. This review determined that the devices actuated by the Unit 1 and Unit 2 "A" train SSPS are virtually identical.

The contact loading study recorded the manufacturer, model, and device ratings of each actuation device (solenoid or relay) operated by each slave relay contact. In the contact loading study, all slave relay single contacts were evaluated for overload, continuous current and switching capabilities for both ac and dc contact applications of the slave relay contacts. The contact de-rating required for inductive loads was considered in determining the acceptability of the loading. All slave relay contact loadings were found to be acceptable. Additionally, a review of the slave relay surveillance history found no intermittent contact failures indicative of contact erosion. VEGP reviewed plant modifications and also considered low-level current (10-20 mA such as multiplexing circuits) loading. The design modification electrical review process includes direction to review the effect of changes in control circuit loading on the ratings of contacts in the circuit. Since all single contact loads are acceptable and adequate guidance is provided in the design modification process, single contact overloading is not a concern for VEGP slave relay circuitry.

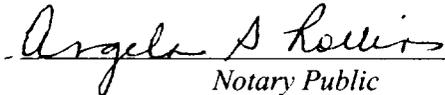
VEGP does not use parallel contacts on slave relays to increase the contact continuous current and break ratings. However, in several cases, two contacts in series are used to increase dc contact current make and break capability. The two contacts in series act to increase contact separation, which increases both the maximum dc voltage and current that can be controlled. Series contacts are subject to some of the same concerns as parallel contacts, since independent contacts may not operate at exactly the same time. If one contact opens or closes earlier than the other, most of the arcing will still occur on one contact. The series contact application is used in a small number of relays to actuate equipment that has design loading above the contact ratings for single contacts. A resistor/capacitor (RC) network was developed to improve the interrupting capability of these MDR relay contacts. During the contact opening, the RC network provides a low impedance path for the initial load current to flow, allowing the MDR contacts to open while breaking a very small current. Moreover, a full wave rectifier suppression device was also used in parallel with the relay coil to suppress the inductive spikes during interruption. This modification alleviated solenoid stress by dissipating the coil energy after de-energization. The result is that these MDR contacts are operating within their design bases.

Mr. J. B. Beasley, Jr. states that he is Vice President of Southern Nuclear Operating Company and is authorized to execute this oath on behalf of Southern Nuclear Operating Company and that, to the best of his knowledge and belief, the facts set forth in this letter are true.

SOUTHERN NUCLEAR OPERATING COMPANY

By:   
J. B. Beasley, Jr.

Sworn to and subscribed before me this 15<sup>th</sup> day of June, 2000.

  
Notary Public

My commission expires: 12-27-02

JBB/JPC

cc: Southern Nuclear Operating Company  
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Mr. M. Sheibani  
SNC Document Management

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