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**Donald F. Schnell**  
Vice President

November 13, 1987

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

Gentlemen:

ULNRC-1678

DOCKET NUMBER 50-483  
CALLAWAY PLANT  
NRC GENERIC LETTER 83-28

Reference: NRC Request for Additional Information  
Regarding Generic Letter 83-28, Item 4.2  
(Parts 3 and 4), T. W. Alexion (NRC) to  
D. F. Schnell (UE) dated 9/8/87

The referenced letter requested additional information regarding the adequacy of reactor trip breaker life testing, as documented by Westinghouse in their topical report WCAP-10835. Based on the discussions in the attachment, Union Electric maintains that the requirements of Generic Letter 83-28, Item 4.2 (Parts 3 and 4) have been satisfied for Callaway Plant. If you have any questions on the attachment, please contact us.

Very truly yours,

*Donald F. Schnell*  
Donald F. Schnell

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Attachment

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STATE OF MISSOURI )  
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CITY OF ST. LOUIS )

Donald F. Schnell, of lawful age, being first duly sworn upon oath says that he is Vice President-Nuclear and an officer of Union Electric Company; that he has read the foregoing document and knows the content thereof; that he has executed the same for and on behalf of said company with full power and authority to do so; and that the facts therein stated are true and correct to the best of his knowledge, information and belief.

By Donald F. Schnell  
Donald F. Schnell  
Vice President  
Nuclear

SUBSCRIBED and sworn to before me this *13<sup>th</sup>* day of *November*, 1987

Barbara J. Pfaff  
BARBARA J. PFAFF  
NOTARY PUBLIC, STATE OF MISSOURI  
MY COMMISSION EXPIRES APRIL 22, 1989  
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Qualification of the DS-416 reactor trip breakers was conducted by Westinghouse with consideration given to all significant mechanisms of degradation which could affect the functional capability of the breakers. Thermal aging is not a requirement for this qualification program, as discussed hereinafter.

The breakers, which contain primarily metallic and the non-metallic materials, have been evaluated by analysis in the Westinghouse topical report "Equipment Qualification Test Report Materials Aging Analysis," WCAP-8687, Supplement 2, Appendix A2 (Proprietary). Arrhenius plots for the non-metallic materials demonstrate acceptable performance after 40 years at 50°C. As documented in WCAP-8587, "Methodology for Qualifying Westinghouse WRD Supplied NSSS Safety-Related Electrical Equipment," Revision 6-A, reactor trip switchgear does not experience pronounced property degradation due to thermal aging. Therefore, seismic testing on unaged switchgear is not prejudiced by any inservice thermal aging mechanisms. WCAP-8587 was approved by NRC on 11/10/83.

As documented in FSAR Section 3.11(B).5.7, qualified life expectancy is not established for equipment located in mild environments. This is consistent with Generic Letter 82-09 and the Statements of Consideration supporting 10CFR50.49 (48FR2729). The reactor trip breakers are subject to extensive QA, maintenance, and surveillance programs which, per the above references, are sufficient for demonstrating their qualification in a mild environment application. In addition, parameters affecting operation of the reactor trip switchgear, such as undervoltage trip attachment (UVTA) drop-out voltage, UVTA trip force and breaker load, and breaker response time, are included in our trending program and degradation of operability would be detected. (ref. ULNRC-1002 dated 12/27/84).

In the licensing review of seismic and dynamic qualification of equipment for the SNUPPS plants, the NRC review team also indicated that an adequate surveillance and maintenance program was sufficient for monitoring age-related degradation of mild environment equipment.

IEEE Standard 323 was revised in 1983 to provide specific guidance for qualification of mild environment equipment. IEEE-323-1983 states that qualified lives are not required for equipment located in mild environments and which have no significant aging mechanisms. IEEE Standard 323-1983 also states that, with regard to seismic testing of equipment located in mild environments, pre-aging prior to seismic tests is required only where significant aging mechanisms exist.

Therefore, the requirement to establish qualification using IEEE-323-1974 goes beyond current regulatory guidelines for mild environment equipment. In recognition of this fact, the discussion of compliance with Regulatory Guide 1.89 in Callaway FSAR Section 3A takes exception to the recommendations of this regulatory guide with regard to equipment in mild environment applications.

Wyle Labs has tested several electrical devices to assess the extent of any correlation between aging and seismic qualification for electrical equipment, including several switchgear components such as terminal blocks, fuse blocks, relays, and circuit boards (reported in EPRI NP-3326 and EPRI NP-5024). The general conclusion from this test program is that, except for certain switches, accelerated aging (thermal, radiation, and cycling) did not degrade seismic performance either during or after strong motion excitation. Switches for which an aging-seismic correlation was observed are not used in reactor trip switchgear at Callaway (no rotary, limit, or pressure switches).

The original testing on reactor trip switchgear with DS-416 breakers (Westinghouse EQDP ESE-20) did not include the performance of thermal aging, based on the materials analysis discussed above. This test program included 1000 operations prior to seismic testing. After being upgraded to Class 1E, the shunt trip attachments were qualified in a program that included thermal and mechanical aging prior to seismic testing (Westinghouse EQTR E62A, Addendum 1, Proprietary). The shunt trip attachments (STAs) were aged for 5510 hours at 105°C. Using an activation energy of 0.65 eV, which is conservatively high for STA non-metallic materials, this equates to 40 years at 40°C (40°C is the design maximum ambient temperature for the reactor trip switchgear).

Given the above, it is our position that the DS-416 breakers and trip attachments are not affected by thermal aging and are, therefore, limited only by mechanical (cyclic) life considerations. The cyclic life testing documented in WCAP-10835, "Report of the DS-416 Reactor Trip Breaker Undervoltage and Shunt Trip Attachments Life Cycle Tests," demonstrated acceptable performance of both trip attachments and breakers after 2500 operations. Two breakers experienced over 10,000 operations. Our conservatively high estimate of 1,650 operations over 40 years is based on two (2) cycles every 62 days for monthly surveillances per Technical Specification Table 4.3-1, 11 cycles every refueling outage during breaker maintenance, and 840 cycles per FSAR Table 3.9(N)-1 which include reactor trips during upset, emergency, and faulted conditions. Only the trip attachments contain non-metallic materials critical to the breaker's safety function. Both the UVTA and STA have cyclic life restrictions of 1,250 operations at Callaway which is one-half of that demonstrated in WCAP-10835.