



**UNION ELECTRIC COMPANY**

1901 Gratiot Street, St. Louis

February 10, 1986

Donald F. Schnell  
Vice President

Mr. Harold R. Denton, Director  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Dear Mr. Denton:

ULNRC- 1255

CALLAWAY PLANT  
DOCKET NUMBER 50-483  
LICENSE NUMBER NPF-30  
WIDE RANGE GAS MONITOR  
ACCIDENT IODINE SAMPLING

- Ref: 1. ULNRC-1095, dated May 14, 1985  
2. ANL-75-78, "Characterization of Particulate Plutonium Released in Fuel Cycle Operations", W. B. Seefeldt, W. J. Mecham, and M. J. Steindler, Argonne National Laboratory, May 1976  
3. HASL-312, "Guidance for Air Sampling at Nuclear Facilities, A. J. Breslin, Health and Safety Laboratory, NY, November 1976.  
4. Bulletin 104D, Cambridge Filter Corporation, 1963.  
5. "Methods for Rating the Efficiency of Air Filters", Cambridge Filter Corporation.  
6. CRC Handbook of Chemistry and Physics, 55 Edition, R.C. Weast Editor, CRC Press, Ohio, 1974.

Reference 1 requested a variance from performing an empirical determination of line loss correction factors for post accident iodine sampling from the unit vent wide range gas monitor. In reviewing this variance request, Mr. Robert Fell of your staff requested that we determine if our sample lines for the wide range gas monitor would deposit greater than fifty percent of 0.01-micron particles using data contained in ANSI N13.1-1969, Table B2.

The Callaway Plant wide range gas monitoring system consists of four sample lines and associated isokinetic nozzle assemblies. Two 3/4-inch sample lines approximately 112 feet in length are provided to allow collection of unit vent samples at normal activities. These lines are fitted with nozzle assemblies sized to maintain isokinetic sampling at normal and emergency unit vent flow rates. Two 3/8-inch sampling lines approximately 105 feet in length are provided to allow collection of unit vent samples at high (accident) activities. These lines are also fitted with nozzle assemblies sized to maintain isokinetic sampling at normal and emergency unit vent flow rates. The collection of high

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activity samples necessitates a decreased sample flow rate and smaller diameter sample lines for reducing sample volume to minimize exposure to personnel and avoid saturation of counting equipment.

Samples are drawn from the plant unit vent downstream of HEPA and charcoal air filters. References 2 to 6 show that HEPA filters have a minimum removal efficiency for particles in the range of 0.22 to 0.44 micron. Removal efficiencies increase with larger and smaller particle sizes. The larger particles are preferentially removed by the filter since they are too large to pass through the openings in the filter. The smaller particles are removed by Brownian diffusion into the filter media. Therefore, the accuracy of calculations used to predict particulate deposition using 0.01 micron as the mean particle size cannot be supported.

Since Table B2 of ANSI 13.1 only evaluates particulate deposition up to a particle size of 0.1 micron, considering the Callaway design, this size would more likely approach the actual particle distribution rather than 0.01 micron. Using the more representative 0.1 micron particle size, less than twenty percent of the particulates will be deposited in the wide range gas monitor sample lines.

If you have any questions regarding this response or if additional information is required, please let me know.

Very truly yours,



Donald F. Schnell

BFH/bjk

STATE OF MISSOURI )  
 ) S S  
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 11<sup>th</sup> day of February, 1986.

Barbara J. Pfeff  
BARBARA J. PFEFF  
NOTARY PUBLIC, STATE OF MISSOURI  
MY COMMISSION EXPIRES APRIL 22, 1989  
ST. LOUIS COUNTY

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