

VIRGINIA ELECTRIC AND POWER COMPANY  
RICHMOND, VIRGINIA 23261

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W. L. STEWART  
VICE PRESIDENT  
NUCLEAR OPERATIONS

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October 7, 1983

Mr. James P. O'Reilly  
Regional Administrator  
Region II  
U. S. Nuclear Regulatory Commission  
101 Marietta Street, Suite 2900  
Atlanta, Georgia 30303

Serial No. 242B  
NO/WDC:acm  
Docket Nos. 50-280/D  
50-281  
License Nos. DPR-32  
DPR-37

Dear Mr. O'Reilly:

BETA RADIATION DOSE MEASUREMENTS EVALUATION  
SURRY POWER STATION UNIT NOS. 1 AND 2

On April 11, 1983, Virginia Electric and Power Company (Vepco) received a Confirmation of Action letter (CAL-280/83-01 and CAL-281/83-01) pertaining to the Surry Power Station. Item Number 3 stated, "By July 5, 1983, complete an evaluation to resolve the discrepancy between beta radiation dose measurements made with portable survey instruments and measurements made with thermoluminescent dosimeters. Until this evaluation is completed, retain detailed survey records to provide sufficient information to adjust thermoluminescent dosimetry results, should such adjustment become necessary. Also, until the above evaluation is completed, control personnel exposure to beta radiation based on dose rate measurements made with portable survey instruments".

In order to resolve this item, Vepco developed the following action plan:

1. Empirically identify the beta spectral components;
2. Determine the response of the beta survey instrumentation (Eberline Model - RO-2A) to the identified spectra and determine a correction factor for this instrumentation;
3. Assess the beta dose to the lens of the eye as it relates to whole body dose;
4. Determine if a beta source similar to the identified station beta spectra is available;
5. Review the thermoluminescent dosimetry (TLD) beta dose algorithms with respect to the identified station spectra in order to determine if a correction factor is required;
6. Expose TLD's to a beta slab source at known distances and dose rates to determine a TLD correction factor;
7. Compare the TLD dose algorithm for Sr/Y-90 to the correction factor determined using the beta slab source.

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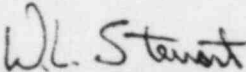
In our letter of July 1, 1983 (Serial No. 242A), Vepco addressed Items 1 through 3 and requested a 90-day extension to address Items 4 through 7. These items have been completed.

The University of Lowell performed the necessary irradiations of the TLD badges using a thallium-204 beta source with an attenuated beta spectral maximum energy of 628 keV. The results of the irradiations indicated that a correction factor of 2.25 should be applied to the Teledyne strontium/yttrium-90 beta dose algorithms.

Personnel exposure records for the first two quarters of 1983, when the highest beta dose rates ever experienced at Surry were encountered due to failed fuel, were thoroughly examined. The newly determined correction factor was applied to the "worst case" skin dose assignment. The resultant total skin dose was calculated to be less than Vepco's administrative limit of 5.0 rem per quarter and well below the regulatory limit of 7.5 rem per quarter. Based on this fact and since skin dose limits apply only to current quarter exposure (i.e., there is no annual or lifetime limit), adjustment of previous quarterly skin dose records is not considered necessary.

Required procedural changes to incorporate the findings of our evaluation will be accomplished by October 15, 1983, and the new correction factor will be utilized to assess exposures received on or after October 1, 1983.

Very truly yours,

  
W. L. Stewart

cc: Mr. Steven A. Varga  
Operation Reactors Branch No. 1  
Division of Licensing

Mr. D. J. Burke  
NRC Resident Inspector  
Surry Power Station