



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION II  
230 PEACHTREE STREET, N. W. SUITE 1217  
ATLANTA, GEORGIA 30303

*Central File*  
*50-280*  
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NOV 20 1978

In Reply Refer To:  
RII:WJM  
50-280/78-20  
50-281/78-20

Virginia Electric and Power Company  
Attn: Mr. W. L. Proffitt  
Senior Vice President, Power  
Post Office Box 26666  
Richmond, Virginia 23261

Gentlemen:

This refers to the inspection conducted by Mr. W. J. Millsap of this office on August 11, 1978, of activities authorized by NRC Operating License Nos. DPR-32 and DPR-37 for the Surry 1 and 2 facilities. The results of this inspection are discussed in our Inspection Report Nos. 50-280/78-20 and 50-281/78-20 which was enclosed with our letter to you dated September 21, 1978.

During the inspection, members of your staff measured the amount of radioactive material in an NRC phantom on the whole body counter. This measurement was also made by other NRC licensees and three Department of Energy laboratories. The results of these measurements are given in the enclosures to this letter.

Enclosure 1 gives the results of the measurements made by your staff, the actual amount of each radionuclide present in the phantom at the time of this measurement, and the ratio of measured to actual amounts. Enclosure 2 gives the ratio of each measurement result to the amount actually present in the phantom at the time of the measurement for all measurements made by DOE laboratories and NRC licensees. Power reactor facility values are denoted by single letters; Department of Energy laboratory values are denoted by double letters. Enclosure 3 discusses general recommendations based on the inspector's observations of these measurements.

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Virginia Electric and Power Co.

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Should you have any questions concerning this letter, we will be glad to discuss them with you. No reply to this letter is required.

Sincerely,



J. T. Sutherland, Chief  
Fuel Facility and Materials  
Safety Branch

Enclosures: As stated

cc w/encl:  
Mr. T. L. Baucom, Manager  
Surry Power Station  
P. O. Box 315  
Surry, Virginia 23883

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Enclosure 1

Facility: Surry Power Station

Facility Designation: I

Date of Measurement: August 11, 1978

	<u>Measurement Result</u>	<u>Actual</u>	<u>Ratio (Measured/Actual)</u>
a. Co-60	0.39 uCi	0.24 uCi	1.63
b. Cs-137	0.31 uCi	0.13 uCi	2.38
c. Co-57	0.11 uCi	0.48 uCi	0.23
d. Cs-134	Not Reported	0.56 nCi	

## Enclosure 2

## Ratios (Measured/Actual)

	<u>Facility</u>	<u>Co-60</u>	<u>Cs-137</u>	<u>Co-57</u>	<u>Cs-134</u>
1.	A*	1.29	1.62	0.07	NR
2.	B	1.08	1.92	1.22	NR
3.	C	1.42	1.31	0.66	NR
4.	D	1.46	0.85	NR**	NR
5.	E	2.04	2.77	NR	NR
6.	F	1.25	0.85	1.22	NR
7.	G	1.42	1.62	1.33	NR
8.	H	0.88	1.62	0.63	43
9.	I	1.63	2.38	0.23	NR
10.	J	2.42	2.62	NR	NR
11.	AA	1.36	1.38	2.97	NR
12.	BB	0.78	0.92	0.67	NR
13.	CC	1.13	1.38	1.00	NR

\* Facility A reported Cr-51 present in the amount of 0.10 uCi. This was not present in the phantom.

\*\* NR - Not Reported.

## Enclosure 3

Observations by the inspector during the course of all phantom measurements suggest three general recommendations for the improvement of the whole body counting programs.

1. The spectrum resulting from each whole body count should be observed in its entirety in order that the presence of unexpected radionuclides will be recognized. Several licensees failed to recognize the presence of the Co-57 apparently because its gamma energy falls outside a predetermined region of interest.
2. Each licensee should determine the energy response (energy/channel) of his detector over the full range of the spectrum. Several licensees had difficulty identifying the Co-57 once the presence of a low energy emitter was recognized because of the unexpected response of the detectors at low energies.
3. Each licensee should consider some sort of intercomparison or independent standard test of his whole body counter(s). A test of this nature might reveal problems not immediately apparent to an individual group working independently of all others.