



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30303

TEEA
50-369

NOV 09 1978

In Reply Refer To:
RII:WJM
50-369/78-25

Duke Power Company
Attn: Mr. William O. Parker, Jr.
Vice President, Steam Production
P. O. Box 2178
422 South Church Street
Charlotte, North Carolina 28242

Gentlemen:

This refers to the inspection conducted by Mr. W. J. Millsap of this office on August 9, 1978, of activities authorized by NRC Construction Permit No. CPPR-83 for the McGuire 1 facility. The results of this inspection are discussed in our Inspection Report No. 50-369/78-25 which was enclosed with our letter to you dated September 22, 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 inspector's observations of these measurements.

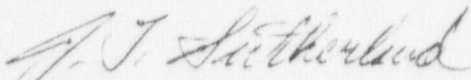
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Duke Power Company

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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

Enclosure: As stated

cc w/encl:

Mr. M. D. McIntosh, Plant Manager
McGuire Nuclear Station
P. O. Box 488
Cornelius, North Carolina 28031

Mr. J. C. Rogers, Project Manager
McGuire Nuclear Station
P. O. Box 2178
Charlotte, North Carolina 28242

Enclosure 1

Facility: McGuire Nuclear Station

Facility Designation: H

Date of Measurement: August 9, 1978

	<u>Measurement Result</u>	<u>Actual</u>	<u>Ratio (Measured/Actual)</u>
a. Co-60	0.21uCi	0.24uCi	0.88
b. Cs-137	0.21uCi	0.13uCi	1.62
c. Co-57	0.3uCi	0.48uCi	0.63
d. Cs-134	0.024uCi	0.56nCi	43

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

Observation by the inspector during the course of all phantom measurements suggested 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 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.