GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY . . . . . 3198 CHESTNUT STREET
PHILADELPHIA, PENNSYLVANIA 19101, Phone (215) 823-1000

RE-ENTRY AND
ENVIRONMENTAL
SYSTEMS DIVISION

April 9, 1976

Nuclear Regulatory Commission
Region I
Directorate of Regulatory Operations
631 Park Avenue
King of Prussia, Pa. 19406

Director of Regulatory Operations
Nuclear Regulatory Commission
Washington, D.C. 20545

Dear Sirs:

This is the letter of March 25, 1976 to Region I of the Nuclear Regulatory Commission as revised on April 9, 1976.

This letter details exposure investigations on four persons whose TLD whole body personnel badges had recorded exposures over the quarterly limits.

Teledyne Isotopes provides GE/RESD with TLD badge service. Teledyne Isotopes is located in Westwood, New Jersey.

The recorded whole body exposures for Mr. A reached GE/RESD on 12/15/75. The recorded whole body exposures for Mr. B, Mr. C and Mrs. D were received on 3/10/76.

All four of these recorded exposures are considered erroneous in that they do not represent true exposure to ionizing radiation. The TLD readout procedures at Teledyne Isotopes are believed to have caused the high recorded exposures. This problem is discussed in the letters of 1/19/76 and 2/23/76 (Attachment 1) which concerned the recorded exposure of Mr. A, a Los Alamos Scientific Lab employee and which were sent to Mr. Storm of LASL.

If there are any questions, please feel free to call.

Yours truly,

J. R. McFadden

J. R. McFadden, Health Physicist
Industrial Safety Engineering

/ktd

Attachments

F26

ATTACHMENT 1

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RE-ENTRY AND ENVIRONMENTAL SYSTEMS DIVISION

GENERAL ELECTRIC COMPANY . . . . . 3198 CHESTNUT STREET
PHILADELPHIA, PENNSYLVANIA 19101, Phone (215) 823-1000

January 19, 1976

Mr. E. Storm
M.S. 692 H-1
Los Alamos Scientific Lab
P. O. Box 1663
Los Alamos, New Mexico 87545

Dear Mr. Storm:

On August 14, 1975, GE/RESD received a mass simulator from LASL to be used in tests and returned to LASL.

A direct survey on 8/14/75 with a William B. Johnson GSM-5 meter with a thin window GM detector (usually used for counting smears) resulted in the following readings: 3.0 mr/hr at surface of mass simulating device; 0.5 at one foot away; and 0.1 at three feet away.

Mr. A, a LASL employee, was issued a TLD personnel radiation badge (whole body) (Teledyne Isotopes, Westwood, New Jersey) on 8/14/75; Mr. A informed me that he worked in the vicinity of the simulator for four (4) hours on 8/14, eight hours on 8/15, eight (8) hours on 8/18 and eight (8) hours on 8/19; he left Philadelphia on 8/20; also, Mr. A stated that fourteen (14) hours at one (1) foot from the simulator and fourteen (14) hours at three (3) feet was a reasonable breakdown of his time spent in the vicinity of the simulator.

Mr. E, a LASL employee, worked with Mr. A on 8/18/75 and 8/19/75; Mr. E was also issued a TLD personnel radiation badge.

On 12/17/75, I informed you over the telephone that Teledyne reported the following recorded exposures for the radiation badge worn by Mr. A: zero (0) mrem (beta/low x-ray) and forty-four hundred (4400) mrem (High x-ray/gamma). Our telephone conversation concerned the possibility that this recorded exposure could be erroneous; the following points were discussed:

(1) Direct survey readings made on 8/14/75.

(2) Badge results for Mr. E: zero (0) mrem (beta/low x-ray) and one hundred and twenty-five (125) mrem (high x-ray/gamma).

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On 12/17/75, a Teledyne representative was contacted by phone, and he said that there was a procedure for confirming radiation badge exposures; he was requested to confirm the reported exposures to visitor badges 65 (Mr. A) and 73 (unused).

On 12/31/75, Teledyne reported that the reported exposures had been confirmed and that badges 611 thru 615 (615 used as control) had been received and would be processed immediately. On 1/6/76, Teledyne called and gave the readings verbally for badges 611 thru 614; the Teledyne representative also stated that along with a written record of the readings for 611 thru 614 (corrected for energy), an adjusted reading for badge No. 65 (Mr. A) would be provided; he said that the readings on badges 611 thru 614, the conditions under which these badges were exposed, and the conditions under which badge No. 65 was exposed (fourteen hours at one foot and fourteen hours at three feet) would be used to make this adjustment.

The teledyne representative also provided a possible cause for erroneous readouts on TLD's used by GE/RESD. GE/RESD is their only customer which has continued to order their old style TLD badge which contains three separate TLD discs; the new style badge arrangement requires the customer to insert a single, large area TLD wafer in a badge;they had continued providing GE/RESD with the old style as a courtesy even though it caused readout problems since the readout parameters are different; GE/RESD is now using the new TLD badge arrangement.

As soon as I receive the written report from Teledyne with badge No. 65's adjusted exposure, I will forward a copy.

Yours truly,

J. R. McFadden

J. R. McFadden, Health Physicist
Industrial Safety Engineering

/ktd

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RE-ENTRY AND
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SYSTEMS DIVISION

February 23, 1976

Mr. E. Storm
M.S. 692 H-1
Los Alamos Scientific Lab
P. O. Box 1663
Los Alamos, New Mexico 87545

Dear Mr. Storm:

This letter concerns the technical overexposure to Mr. A, a LASL employee, and reference is made to my previous letter dated January 19, 1976.

First, Teledyne has not yet provided the adjusted exposure reading for Mr. A's badge.

Second, the meter readings in the second paragraph on page one of the letter dated January 19, 1976 are in error; they are low by a factor of ten.

Third, a conservative estimate of Mr. A's exposure would be two hundred and fifty (250) mrem (high x-ray/gamma) and zero (o) mrem (beta/low x-ray). This figure (250 mrem) was arrived at by multiplying Mr. E's recorded exposure by two. This seemed reasonable since Mr. A and Mr. F worked as a team for two days (with Mr. A working closer to the device); then Mr. A and Mr. E worked as a team for two days (with Mr. E working closer to the device). This estimate is said to be conservative since using the highest direct survey results (obtained with the Eberline E-120 meter) and fourteen hours each at one and three feet yields a theoretical exposure of 189 mrem.

Teledyne's adjusted reading for Mr. A will be forwarded to you when received. Enclosed is a copy of the original Teledyne report.

If there are any questions, please feel free to call.

Yours truly,

J. R. McFadden

J. R. McFadden, Health Physicist
Industrial Safety Engineering

/ktd

ATTACHMENT 2

The following recorded whole body exposures were for Mr. A's badge covering the period from 8/14/75 to 8/19/75:

0 mrem (beta/low x-ray)

4400 mrem (high x-ray/gamma)

Copies of two letters (1/19/76 and 2/23/76 - Attachment 1) sent to Mr. E. Storm at Los Alamos Scientific Lab (LASL) detail the exposure investigation made on Mr. A and are enclosed.

Mr. A had a LASL badge during his four day visit at GE/RESD, but he kept it in his briefcase while here since he had been issued a GE radiation badge; LASL reported by telephone that Mr. A's LASL badge had zero recorded exposure for the period under question.

ATTACHMENT 4

The following recorded exposures were reported for Mr. T's fourth quarter badge (1975):

0 mrem (beta/low x-ray)

80 mrem (high x-ray/gamma)

Mr. C recalls no dental or other diagnostic x-ray procedures performed during this period; he habitually locks his badge inside his tool box before leaving work and his tool box remains at the work place.

The following is Mr. C's exposure history:

Quarter	rem beta/low x-ray	rem high x-ray/gamma
IV 1968	m	m
I 1969	m	m
II	m	.03
III	m	m
IV	m	m
I 1970	0	0
II	0	0
III	0	0
IV	0	0
I 1971	0	0
II	0	0
III	0	0
IV	0	0
I 1972	0	0
II	0	0
III	0	0
IV	0	0
I 1973	0	0
II	0	0
III	0	0
IV	0	0
I 1974	0	0
II	0	.055
III	0	0
IV	0	0
I 1975	0	0
II	0	.155
III	0	0

ATTACHMENT 5

The following recorded whole body exposures were reported for Mrs. D's fourth quarter badge (1975):

16,500 mrem (beta/low x-ray)

1,500 mrem (high x-ray/gamma)

Mrs. D works with only one source of ionizing radiation, i. e., a low specific activity compound. This compound is used on a "secret" government contract and is referenced to as compound "o". Mrs. D has worked with this material since 1968 to the present with about one year off due to pregnancy. Mrs. D's exposure history is as follows:

Quarter		rem beta/low x-ray	rem high x-ray/gamma
IV	1968	m	m
I	1969	m	m
II		m	m
III		7.5[a]	1.25[a]
IV		m	m
I	1970	0	0
II		0	0
III		.03	.05
IV		0	0
I	1971	0	0
II		0	0
III		0	0
IV		.06	0
I	1972	0	0
Off Service			
III	1973	0	0
IV		0	0
I	1974	0	0
II		.02	0
III		0	0
IV		.035	0
I	1975	0	0
II		.08	0
III		0	0

a - badge not returned

ATTACHMENT 5

The following are the recorded exposures for the area monitor badges in the compound "O" area for the fourth quarter of 1975:

Area Monitor	rem beta/low x-ray	high x-ray/gamma
101	0.6	1.700
102	0.105	0.08
103	0.28	0.89
104	0.035	0.105
105	0.045	0.085
106	0	0.42
107	0.04	0.055
108	0.115	0.095

Area Monitor 101 is positioned about 12 inches from an unshielded storage bin containing compound "o"; it is left in place for 24 hours per day, seven days per week, and 13 weeks per quarter; this storage bin contains a larger quantity of the radioactive material than any other location in the room by a factor of two.

Area monitor 103 is also in the immediate vicinity of the storage bin.

Mrs. D does not recall any dental or other diagnostic x-ray procedures during the period in question; Mrs. D takes her badge home during non working hours and it is kept in a clothes closet in her handbag.

Again, the recorded exposure is not accepted as a true indication of exposure to ionizing radiation. Again, a readout error at Teledyne is the most likely cause of the recorded reading. Since work activity per quarter over the past year has been decreasing in the compound "O" program, an average of the previous four quarters would be a conservative estimate of the true exposure for the fourth quarter of 1975.

ATTACHMENT 6

Mr. A: (b)(6)

Social Security Number: (b)(6)

Date of Birth: (b)(6)

Employee of Los Alamos Scientific Lab

Estimated Whole Body Exposure:

3RD QUARTER 1975

0 mrem (beta/low x-ray)
250 mrem (high x-ray/gamma)

ATTACHMENT 6

Mr. E: (b)(6)
Social Security No. (b)(6)
Date of Birth: (b)(6)

Mr. F: (b)(6)
Social Security No. (b)(6)
Date of Birth: (b)(6)

Mr. G: (b)(6)
Social Security No. (b)(6)
Date of Birth: (b)(6)

Mr. H: (b)(6)
Social Security No. (b)(6)
Date of Birth: (b)(6)

Mr. I: (b)(6)
Social Security No. (b)(6)
Date of Birth: (b)(6)

Mr. J: (b)(6)
Social Security No. (b)(6)
Date of Birth: (b)(6)

Mr. K: (b)(6)
Social Security No. (b)(6)
Date of Birth: (b)(6)

Mr. L: (b)(6)
Social Security No. (b)(6)
Date of Birth: (b)(6)

Mr. M: (b)(6)
Social Security No. (b)(6)
Date of Birth: (b)(6)

Mr. N: (b)(6)
Social Security No. (b)(6)
Date of Birth: (b)(6)

ATTACHMENT 6

Mr. O: (b)(6)
Social Security No. (b)(6)
Date of Birth: (b)(6)

Mr. P: (b)(6)
Social Security No. (b)(6)
Date of Birth: (b)(6)

Mr. Q: (b)(6)
Social Security No. (b)(6)
Date of Birth: (b)(6)

Mr. R: (b)(6)
Social Security No. (b)(6)
Date of Birth: (b)(6)

Mr. S: (b)(6)
Social Security No. (b)(6)
Date of Birth: (b)(6)

Mr. (b)(6)
Social Security (b)(6)
Date of Birth: (b)(6)