

DMB COPY

University of Notre Dame
Notre Dame, Indiana 46556

Assistant Vice President
for Business Affairs

May 23, 1985

Telephone (219) 239-8848

30-694
70-243

Mr. D. J. Sreniawski, Chief
Nuclear Materials Safety Section 2
U. S. Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Dear Mr. Sreniawski:

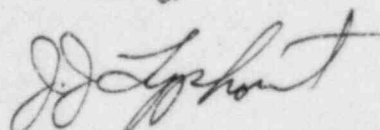
This is a reply to your letter of April 29, 1985, which indicated certain licensed activities conducted at the University of Notre Dame appeared to be in noncompliance with NRC requirements as determined in an inspection conducted March 25-27, 1985, by your representative, Ms. T. L. Simmons. Items of noncompliance were listed in an Appendix attached to your letter.

The Radiation Control Committee met on May 22, 1985, to review your report, ascertain that appropriate action had been taken on items of noncompliance, and to approve the contents of this response.

We believe we have taken necessary steps to comply with all items of noncompliance as evidenced by statements and exhibits enclosed. Please be assured that it is our intention and desire to comply with all NRC regulations.

If we can further clarify statements contained in our attached Response to Items of Noncompliance, or if we can be of assistance to you in any way, please let us know.

Sincerely,



James J. Lyphout
Asst. Vice President of Business Affairs

8506040415 850523
REG3 LIC30
13-01983-15 PDR

Enclosures

MAY 28 1985

IE07
11

University of Notre Dame du Lac
Response to Items of Noncompliance
May 23, 1985

Item 1. Under License No. 13-01983-15

Drs. Emerson Funk, John Mihelich, and Sperry Darden conducted a complete inventory of all radioactive material stored in the two safes located in the Physics Department. These inventories are attached as Appendix A. Dr. Funk will be responsible for maintaining an accurate inventory of all radionuclides stored in the safe located in room 307, Nieuwland Science Hall; and Dr. Sperry Darden will be responsible for maintaining the inventory for the safe located in the Nuclear Structure Lab, Nieuwland Science Hall. These inventories have been submitted to the University's Radiation Safety Officer and corrections to the University's October 1, 1984 inventory and individual Responsible Investigator's inventories have been made to accurately reflect all radioactive material on campus and in the Physics Department. To avoid further noncompliance, updated inventories will be submitted annually to the Radiation Safety Officer and reviewed by the Radiation Control Committee during their annual review of applications from Responsible Investigators for continued use of radioactive material.

Full compliance or documentation of all radioactive material in the two Physics Departments' safes was achieved on May 22, 1985.

Item 2. Under License No. SNM-198

A complete beta, gamma, and neutron radiation survey of the Nuclear Engineering Laboratory, which houses the natural uranium graphite subcritical assembly and source storage area, was conducted March 22, 1985, by the Radiation Safety Officer. Radiation level surveys will be conducted semiannually by the Radiation Safety Officer but will not be conducted annually by students in the

ME 462 laboratory. This requirement to have students survey the lab, as listed in our SNM-198 license, has been deleted from our SNM-198 license renewal application dated May 24, 1985. This requirement was deemed unnecessary due to the present schedule of semiannual surveys by the Radiation Safety Officer. If the University's SNM-198 license has not been renewed by March 1986 (the next offering of the Nuclear section of ME 462), students enrolled in ME 462 will perform a radiation level survey as specified in our existing license requirement.

Full compliance of this item was achieved March 22, 1985.

Item 3. Under License No. SNM-198

The individual, Dr. Edgar Berners, who uses licensed material but has not been approved by the Radiation Control Committee to use these materials, submitted an application for Approval as a Responsible Investigator in the Use of Radioactive Materials and Radiation Sources on April 2, 1985. This application was reviewed by the Radiation Control Committee and approved on May 22, 1985. Dr. Berners was approved to use a 16 gram plutonium/beryllium source, 1 millicurie each of Radium 226 and Cobalt 60, and 10 millicuries of Cesium 137 for the calibration of radiation detectors.

Presently, all licensed material is used by, or under the supervision of, individuals designated by the Radiation Control Committee. To avoid further noncompliance, each application of radioactive material will be reviewed by the Radiation Safety Officer to ensure licensed material is used by, or under the supervision of, individuals designated Responsible Investigators by the Radiation Control Committee.

Full compliance or the approval of Dr. Edgar Berners as a Responsible Investigator was achieved on May 22, 1985.

Radioactive Source Inventory May 15, 1985 E. G. Funk and J. W. Mihelich
Physics Department , Nieuwland Science Hall

I. Sources Stored in Safe in Room 307 ("HOT LAB ")

Identification Number	Radionuclide	Approx. Activity (<u>microcuries</u> unless noted)	Storage Area (Shelf number of safe in Rm. 307)
HTM 1 through 4	Sr90 - Y90	0.09 each (0.36 total)	1
HTM 5 through 13	Cs137-Ba 137m	9 each (81 total)	1
HET 1 through 12	Sr90	0.1 each (1.2 total)	1
HET 13 through 22	Cs137	5 each (50 total)	1
HT-1	Co57	20	2
HT-2	Co57	540	2
HT 3 through 9	Cs137	10 each (70 total)	2 (Gray box-G.B.)
HT-10	Cs137	0.12	2 (G.B.)
HT-11	Na22	0.003	2 (G.B.)
HT-12	Cs137	0.07	2 (G.B.)
HT-13	Cs137	1.2	2 (G.B.)
HT-14	Co60	0.14	2 (G.B.)
HT-15	Na22	0.08	2 (G.B.)
HT-16	Co60	0.9	2 (G.B.)
HT-17	Co60	1.0	2 (G.B.)
HT-18	Cs137	0.01	2 (G.B.)
HT-19	U glass	< 0.01	2 (G.B.)
HT-20	Cd109	0.1	2 (G.B.)
HT-21	Tl204	0.25	3
HT-22	Tl204	2.5	3
HT-23	Bi210	0.12	3
NOTE: HT 24 through 35 are liquid scint. ctr. standards.			
HT 24 through 29	C14	0.075 each (0.45 total)	3
HT 31 through 35	H3	0.12 each (0.60 total)	3
NOTE: No source has been labeled HT-36.			
HT 37 through 46	Tl204	0.02 each (0.2 total)	3
HT-47	C14	0.1	3
HT-48	C14	0.1	3
HT-49	C14	0.1	3

I. Sources Stored in Safe in Room 307 ("HOT LAB ") (continued)

Identification Number	Radionuclide	Approx. Activity (<u>microcuries</u> unless noted)	Storage Area (Shelf number of safe in Rm. 307)
HA-1	Na22	0.34	4
HA-2	Na22	1.3	4
HA-3	Cs137	14	4
HA-4	Co60	1.7	4
HA-5	Co60	0.22	4
HA-6	Eu152,154	0.67	4
HB-1	Ba133	1.0	4
HB-2	Bi207	0.8	4
HB-3	Co60	2	4
HB-4	Ta182	1	4
HC-1	Eu150	0.04	4
HC-2	Ag108m	0.1	4
HC-3	Eu152	30	4
HC-4	Eu154	2.0	4
HC-5	Eu154	25	4
HC-6	Eu152	2.5	4
HC-7	Cs137	2.8	4
HC-8	Cs137	7	4
HC-9	Bi207	4	4
HC-10	Pr142	16	4
HC-11	Bi207	5	4
HC-12	Thorium metal	0.1	4
HC-13	Ra226	2	4
HC-14	Cs137	2	4
HC-15	Ho166m	1.1	4
HC-16	Cs137	3	4

NOTE: HI 1 through 4 are unknown, low-level activities present in targets from very old irradiations or stock sources which should have decayed. These activities will be investigated.

HI-1	Old Sn113 bottle	0.3	4
HI-2	Natural Eu + p	< 0.1	4
HI-3	Natural Gd + p	<1	4
HI-4	Old Gd 162 bottle	<1	5, Pb House

I.Sources Stored In Safe in Room 307 ("HOT LAB ")

Identification Number	Radionuclide	Approx. Activity (<u>microcuries</u> unless noted)	Storage Area (Shelf number of safe in Rm. 307)
Hα-1	Am241	0.1	4
Hα-2	Cm244	1.0 millicuries	2
HX-1	Am241 (X-ray source)	10 millicuries	4
HM-1	Cd109	< 1	4
HM-2	Cs137	5	5, lead house (5LH)
HF-1	Eu152,154	25	5LH
HW-2	Cs137	< 0.1	5LH

NOTE: All HS sources are stock solutions in bottles which are stored in small lead containers inside the lead houses on the bottom shelf (shelf 5) of safe, (storage area designated 5LH).

HS-1	Ag108m	10	5LH
HS-2	Na22	10	5LH
HS-3	Na22	5	5LH
HS-4	Cs137	3 millicuries	5LH
HS-5	Co60	0.12 millicuries	5LH
HS-6	Cs137	0.10 millicuries	5LH
HS-7	Eu152	0.3 millicuries	5LH
HS-8	Bi207	20	5LH
HS-9	Bi207	40	5LH
HS-10	Cs134	0.3	5LH
HS-11	Ba133	85	5LH
HS-12	Ce144	0.004	5LH
HS-13	Ag108m	10	5LH
HS-14	Ho166m	10	5LH
HS-15	Pm145	33	5LH
HS-16	Ag108m	30	5LH
HS-17	Cs137	0.5 millicuries	5LH
HS-18	C14	25	5LH

II. Sources Stored in Lead House, South Side of WEST TARGET ROOM - Accelerator Area, Room 124

Identification Number	Radionuclide	Approx. Activity (<u>microcuries</u> unless noted)	Storage Area
W-10	Mixed NBS standard	0.2	Lead House (LH)
W-11	Thorium oxide (vial)	<1	LH
W-12	Co60	1.3	LH
W-13	Eu152	1.0	LH

NOTE: Sources WC 1 through 9 are calibrated gamma reference sources in a small wooden box stored under lead (behind the lead house, BLH)

WC-1	Am241	10.9	BLH
WC-2	Ba133	7.8	BLH
WC-3	Cs137	10.0	BLH
WC-4	Co60	6.76	BLH
WC-5	Y88	0.00074	BLH
WC-6	Na22	3.52	BLH
WC-7	Mn54	0.33	BLH
WC-8	Hg203	< 1 dis/min	BLH
WC-9	Co57	0.226	BLH

III. Sources Stored in Room 102B in Lead House on Table (North Wall)

B-1	Co60	<1	LH
B-2	Cs137	9	LH
B-3	Na22	<0.1	LH

Sources Stored in Safe in Room 124, Accelerator Area, Nieuwland Science Hall.

Identification Number	Radionuclide	Approx. Activity (<u>microcuries</u> unless noted)	Storage Area (Shelf in Safe)
------------------------------	---------------------	---	---

NOTE: T1 through T5 are accelerator targets which are radioactive materials.

T-1	C14	< 0.5 millicuries	Shelf 1
T-2	C14	2 millicuries	Shelf 1
T-3	C14	2 millicuries	Shelf 1
T-4	H3	1 Curie	Shelf 1
T-5	H3	1 Curie	Shelf 1

Assorted slightly radioactive stripper components and beam collimator parts from accelerator and target holder for C14 targets:

< 0.1 mR/hr at contact Shelf 1

S-1	Ra226	5.0	Bottom Bin
S-2	Co60	3	Shelf 2
S-3	Cs137	1.2	Shelf 2
S-4	Cs137	2.4	Shelf 2
S-5	Bi207	1.0	Shelf 2
S-6	Na22	0.009	Shelf 2
S-7	Na22	0.005	Shelf 2
S-8	Co60	0.06	Shelf 2

SB-1	UX2	< 1	Bottom Bin
SB-2	Bi210	< 1	Bottom Bin
SB-3	Sb125	< 1	Bottom Bin
SB-4	C14	< 1	Bottom Bin
SB-5	Co60	< 1	Bottom Bin

Source S-9 is stored in lead container placed in lead pig on floor alongside safe. Source disposal is presently being investigated by R. Zerr.

S-9	Ra-Be source	100 millicuries	Lead pig next to safe.
-----	--------------	------------------------	------------------------

Explanation of Letters Used for Source Identification

I. All sources labelled with designation beginning with H are stored in the HOT Lab, Room 307, Nieuwland Science Hall.

- HA - Sources in angular correlation source holders.
- HB - Beta or conversion electron sources. Unsealed, on small frames, but stored in individual plastic boxes.
- HC - Calibration Sources
- HET - Sources for elementary teaching labs.
- HF - Flat-field wire sources. Source plated on Pt wire.(stored in jars)
- HI - Activity unknown. To be Investigated. (very weak).
- HM - Miscellaneous
- HN - Naturally radioactive materials such as ores, ThO etc.
- HS - Stock sources. Most were commercially obtained. Liquids in bottles stored in lead containers.
- HT - Sources used in advanced labs.
- HTM - Minigenerators for elementary and advanced labs.
- HW - Working sources. Used for general calibrations etc.
- HX - X-ray fluorescence sources.

II. All sources labelled with designation beginning with W are stored in lead house in WEST TARGET ROOM, Room 124 (Accelerator Lab)

- WC - Efficiency calibration sources.
- W - Other sources used for energy calibration

III. Sources labelled B are stored in lead house in Room 102 B and are under supervision of Umesh Garg.

IV. Sources Stored in Safe in Room 124 (Accelerator Lab) are designated

- T - radioactive accelerator targets
- SB - Beta sources
- S - General beta and gamma decay sources. .