

HARVARD UNIVERSITY
UNIVERSITY HEALTH SERVICES
ENVIRONMENTAL HEALTH AND SAFETY

46 Oxford Street
Cambridge, Massachusetts 02138
(617) 495-2061

November 27, 1984

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PI

Dr. John E. Glenn, Chief
Nuclear Materials Section B
Division of Engineering and Technical Programs
U.S. Nuclear Regulatory Commission
Region I
631 Park Avenue
King of Prussia, PA 19406

"SECTION COPY"

Dear Dr. Glenn:

Reference: Mail Control No. 98882

Following are the answers in reply to the questions in your letter of October 25, 1984, regarding renewal of our License Number 20-00297-53.

1. We confirm that drinking and irrigation water withdrawal points are not now present within 600 feet of the burial site, nor will they be permitted within 600 feet in the future.
2. We also confirm that appropriate posting and restricted access to the disposal area will be maintained throughout the entire period of disposal and for at least three years following cessation of burial operations.
3. We will be using a building for storage essentially identical to our present facility but longer. The walls are made of 12" thick insulated block, stack bond. The dimensions are 40' by 180' by 16' high, and the building will also have attached a 11'7" X 48' by 8'7" high Bally Cooler, which will be used to store animals for decay to minimize burial requirements. Adequate shielding is provided by the building walls, since the main emission is the low energy gamma radiation from 125I. The storage building is unheated and will be equipped with fire extinguishers and a fire detection (temperature sensitive) unit connected to the main building, where the maintenance and guard office of the Primate Center are located. No flammable materials will be stored in the building. The building is located within 20' of a fire hydrant. The plans have been reviewed and approved by the Town Fire Chief and the Fire and Safety Engineer of the Harvard University Environmental Health and Safety department and are in compliance with all fire codes. It will be kept locked at all times, with access only to authorized personnel.

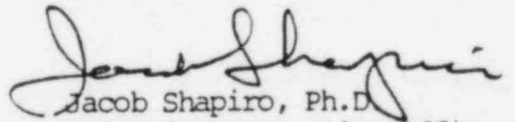
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In accordance with item No. 4 in your letter, we hereby request authorization to perform instrument calibration and sample analysis services at the addresses covered under our license. These services are given through the radiation protection program in effect at Harvard University and the affiliated institutions and available only to individuals holding Harvard appointments. There are no separate charges for calibrations or sample analyses, and the cost of the complete program is born equally by all individuals covered. The design of the program is also subject to review by the participants and to modification in accordance with recommendations. Accordingly our calibrations are being performed as an integral part of the complete radiation program supported by Harvard University and its affiliated institutions. This program functions as an in-house operation.

All new meters will be given a calibration appropriate to the use of the instrument. Instruments to be subsequently used for quantitative measurements will be calibrated every 12 months. Instruments to be used only for qualitative measurements to detect the presence of radioactivity will be checked periodically with a check source for comparison with check source readings taken at the time of the initial calibration. Qualitative instruments with a significant loss in sensitivity will be checked out and recalibrated.

Sincerely,


Jacob Shapiro, Ph.D.
Radiation Protection Officer

JS:dp

"SECTION COPY"

10 DEC 1984

License No. 20-00297-53
Docket No. 030-00753
Control No. 98882

Harvard University
ATTN: Dr. Jacob Shapiro
Radiation Safety officer
46 Oxford Street
Cambridge, Massachusetts 02138

Gentlemen:

Please find enclosed the renewal of your NRC Material License.

Please review the enclosed document carefully and be sure that you understand all conditions. If there are any errors or questions, please notify the Region I Material Licensing Section, (215) 337-5239, so that we can provide appropriate corrections and answers.

Please be advised that you must conduct your program involving licensed radioactive materials in accordance with the conditions of your NRC license, representations made in your license application, and NRC regulations. In particular, please note the items in the enclosed, "Requirements for Materials Licensees."

Since serious consequences to employees and the public can result from failure to comply with NRC requirements, the NRC expects licensees to pay meticulous attention to detail and to achieve the high standard of compliance which the NRC expects of its licensees.

You will be periodically inspected by NRC. A fee may be charged for inspections in accordance with 10 CFR Part 170. Failure to conduct your program safely and in accordance with NRC regulations, license conditions, and representations made in your license application and supplemental correspondence with NRC will result in prompt and vigorous enforcement action against you. This could include issuance of a notice of violation, or in case of serious violations, an imposition of a civil penalty or an order suspending, modifying or revoking your license as specified in the General Policy and Procedures for NRC Enforcement Actions, 10 CFR Part 2, Appendix C.

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We wish you success in operating a safe and effective licensed program.

Sincerely,

Original Signed By:

John E. Glenn

John E. Glenn, Chief
Nuclear Materials Section B
Division of Engineering and
Technical Programs

Enclosures:

1. Amendment No. 37
2. Requirements for Materials Licensees
3. NRC Forms 3 and 313

MATERIALS LICENSE

Amendment No. 37

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 40 and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

Licensee

1. Harvard University

2. Radiation Protection Office
46 Oxford Street
Cambridge, Massachusetts 02138

In accordance with application dated
February 23, 1979,
3. License number 20-00297-53 is amended
in its entirety to read as follows:

4. Expiration date December 31, 1989

5. Docket or
Reference No. 030-007536. Byproduct, source, and/or
special nuclear material7. Chemical and/or physical
form8. Maximum amount that licensee
may possess at any one time
under this licenseA. Any byproduct material
with Atomic Nos. 3 through
83, except as listed in
Subitems 6.C. through 6.K.
below:B. Hydrogen 3
C. Carbon 14
D. Phosphorus 32
E. Krypton 85
F. Xenon 133
G. Iodine 125
H. Iodine 131
I. Strontium 90
J. Iodine 129
K. Sulfur 35
L. Americium 241
M. Polonium 210
N. Curium 244

O. Californium 252

P. Thorium 228
Q. Cobalt 60
R. Cesium 137
S. Strontium 90
T. Americium 241
U. Curium 244V. Uranium depleted in
isotope U-235

A. Any

B. Any
C. Any
D. Any
E. Any
F. Any
G. Any
H. Any
I. Any
J. Any
K. Any
L. Any
M. Any
N. Plated sources
(Isotopes Products, Inc.)
O. Sealed sources (ORNL
platinums foil and SRO
Type ALC or SALC)P. Any
Q. Sealed sources
R. Sealed sources
S. Sealed sources
T. Sealed sources
U. Sealed sources
V. MetalA. 1 curie of each byproduct
material with Atomic Nos.
3 through 83.B. 300 curies
C. 10 curies
D. 3 curies
E. 10 curies
F. 10 curies
G. 2 curies
H. 300 millicuries
I. 50 millicuries
J. 1 millicurie
K. 5 curies
L. 5 millicuries
M. 20 millicuries
N. 5 millicuries

O. 5.6 millicuries

P. 15 millicuries
Q. 20 curies
R. 10 curies
S. 1 curie
T. 500 millicuries
U. 50 millicuries
V. 1000 kilograms~~8502140295~~

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**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License number:

20-00297-53

Docket or Reference number:

030-00753

Amendment No. 37

(Continued)

9. Authorized use

- A. through U. (1) Research and Development as defined in Section 30.4q of Title 10 Part 30, "Rules of General Applicability to Licensing of Byproduct Material."
- (2) Tracer studies in lower animals.
- (3) For calibration of instruments and sample analysis, including services for other institutions.
- A. through K. As waste from Harvard Affiliated Institutions.
- V. For storage and assembly on a calorimeter for testing.

CONDITIONS

- 10. Licensed material shall be used only at the licensee's facilities composing the Cambridge Massachusetts Campus of Harvard University and at Harvard Medical School, 25 Shattuck Street, Harvard School of Public Health, 665 Huntington Avenue, Boston, Massachusetts, Harvard School of Dental Medicine, 188 Longwood Avenue, Boston, Massachusetts, Harvard Laboratory for Human Reproduction and Reproductive Biology, 45 Shattuck Street, Boston, Massachusetts, Seely G. Mudd Building, 250 Longwood Avenue, Boston, Massachusetts, Mallory Laboratory at Boston City Hospital, Boston, Massachusetts, Forsyth Dental Infirmary, 140 Fenway Street, Boston, Massachusetts, Massachusetts Mental Health Center, 74 Fenwood Road, Boston, Massachusetts, Shields Warren Radiation Lab., 50 Binney Street, Boston, Massachusetts, Harvard University animal Primate Research Center, Southboro, Massachusetts, Harvard Forest, Petersham, Massachusetts, or Angell Memorial Building, 180 Longwood Avenue, Boston, Massachusetts. Licensed material in item 6.V. shall be used at 40 Oxford Street, Cambridge, Massachusetts.
- 11. The licensee shall comply with the provisions of Title 10, Chapter 1, Code of Federal Regulations, Part 19, "Notices, Instructions, and Reports to Workers; Inspections" and Part 20, "Standards for Protection Against Radiation."
- 12. A. Licensed material shall be used by, or under the supervision of, individuals designated by the Radiation Safety Committee.
- B. The Radiation Protection Officer for the activities authorized by this license is Dr. Jacob Shapiro.
- 13. A. (1) Each sealed source acquired from another person and containing licensed material, other than Hydrogen 3, with a half-life greater than thirty days and in any form other than gas shall be tested for contamination and/or leakage prior to use. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, a sealed source received from another person shall not be put into use until tested.
- (2) Notwithstanding the periodic leak test required by this condition, any licensed sealed source is exempt from such leak tests when the source contains 100 microcuries or less of beta and/or gamma emitting material or 10 microcuries or less of alpha emitting material.

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License number:

20-00297-53

Docket or Reference number:

030-00753

Amendment No. 37

(13. continued)

CONDITIONS

- (3) Except for alpha sources, the periodic leak test required by this condition does not apply to sealed sources that are stored and not being used. The sources excepted from this test shall be tested for leakage prior to any use or transfer to another person unless they have been leak tested within six months prior to the date of use or transfer.
- B. Each sealed source fabricated by the licensee shall be inspected and tested for construction defects, leakage, and contamination prior to use or transfer as a sealed source. If the inspection or test reveals any construction defects or 0.005 microcurie or greater of contamination, the source shall not be used or transferred as a sealed source until it has been repaired, decontaminated and retested.
- C. Each sealed source containing licensed material, other than Hydrogen 3, with a half-life greater than thirty days and in any form other than gas shall be tested for leakage and/or contamination at intervals not to exceed six months except that each source designed for the purpose of emitting alpha particles shall be tested at intervals not to exceed three months.
- D. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. The test sample shall be taken from the sealed source or from the surfaces of the device in which the sealed source is permanently or semipermanently mounted or stored on which one might expect contamination to accumulate. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission.
- E. If the test required by Subsection A. or C. of this condition reveals the presence of 0.005 microcurie or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Commission regulations. A report shall be filed within 5 days of the test with the U.S. Nuclear Regulatory Commission, Region I, 631 Park Avenue, King of Prussia, Pennsylvania 19406, describing the equipment involved, the test results, and the corrective action taken.
14. Sealed sources containing licensed material shall not be opened.
15. In lieu of using the conventional radiation caution colors (magenta or purple on yellow background) as provided in Section 20.203(a)(1), Title 10, Code of Federal Regulations, Part 20, the licensee is hereby authorized to label detector cells and cell baths, containing licensed material and used in gas chromatography devices, with conspicuously etched or stamped radiation caution symbols without a color requirement.
16. A. Each chromatograph detector containing Nickel 63 shall be tested for leakage and/or contamination at intervals not to exceed six months. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, a detector received from another person shall not be put into use until tested.

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

PAGE 4 OF 5 PAGES

License number

20-00297-53

Docket or Reference number

030-00753

Amendment No. 37

(16. continued)

CONDITIONS

- B. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. The test sample shall be taken from the surfaces of the device in which the foil is mounted or stored on which one might expect contamination to accumulate. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission.
- C. If the test reveals the presence of 0.005 microcurie or more of removable contamination, the licensee shall immediately withdraw the foil from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Commission regulations. A report shall be filed within 5 days of the test with the U.S. Nuclear Regulatory Commission, Region I, 631 Park Avenue, King of Prussia, Pennsylvania 19406, describing the equipment involved, the test results, and the corrective action taken.
- D. Tests for leakage and/or contamination shall be performed by the licensee or by other persons specifically authorized by the Commission or an Agreement State to perform such services.
- 17. A. Detector cells containing titanium tritide foil shall only be used in conjunction with a properly operating temperature control mechanism which prevents foil temperatures from exceeding 225 degrees Centigrade.
B. Detector cells containing scandium tritide foil shall only be used in conjunction with a properly operating temperature control mechanism which prevents foil temperatures from exceeding 325 degrees Centigrade.
- 18. The licensee shall not use licensed material in or on human beings or in field applications where activity is released except as provided otherwise by specific condition of this license.
- 19. Experimental animals administered licensed materials or their products shall not be used for human consumption.
- 20. The licensee shall conduct a physical inventory every six (6) months to account for all sealed sources received and possessed under the license. The records of the inventories shall be maintained for two (2) years from the date of the inventory for inspection by the Commission, and shall include the quantities and kinds of licensed material, location of sealed sources and the date of the inventory.
- 21. The licensee may transport licensed material or deliver licensed material to a carrier for transport in accordance with the provisions of Title 10, Code of Federal Regulations, Part 71, "Packaging of Radioactive Material for Transport and Transportation of Radioactive Material Under Certain Conditions."

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License number:

20-00297-53

Docket or Reference number:

030-00753

Amendment No. 37

(Continued)

CONDITIONS

22. Pursuant to Sections 20.106(b) and 20.302, 10 CFR 20, the licensee is authorized to dispose of licensed material by incineration at the Harvard University Animal Primate Research Center, Southboro, Massachusetts, provided the gaseous effluent from incineration does not exceed the limits specified for air in Appendix B, Table II, 10 CFR 20. Ash residues may be disposed of as ordinary waste provided appropriate surveys pursuant to Section 20.201 are made to determine that concentrations of licensed material appearing in the ash residues do not exceed the concentrations (in terms of microcuries per gram) specified for water in Appendix B, Table II, 10 CFR 20.
23. This license does not authorize commercial distribution of licensed material.
24. Pursuant to Section 20.302 of 10 CFR 20, the licensee is authorized in any twelve months to bury byproduct material with physical half-life of 90 days or less in quantities up to 100,000 times the values specified in Appendix C, 10 CFR Part 20 at the Animal Primate Research Center, Southboro, Massachusetts.
25. The licensee is authorized to hold radioactive material with a physical half-life of less than 90 days for decay-in-storage at the Animal Primate Research Center in Southboro, Massachusetts, before disposal in ordinary trash provided:
 - A. Radioactive waste to be disposed of in this manner shall be held for decay a minimum of ten (10) half-lives.
 - B. Prior to disposal as normal waste, radioactive waste shall be monitored to determine that its radioactivity cannot be distinguished from background with typical low-level laboratory survey instruments. All radiation labels will be removed or obliterated.
 - C. Generator columns shall be segregated so that they may be monitored separately to ensure decay to background levels prior to disposal.
26. Except as specifically provided otherwise by this license, the licensee shall possess and use licensed material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in application dated February 23, 1979; letter dated July 7, 1979; application dated July 10, 1980; letters dated July 10, 1981, May 12, 1983, and October 4, 1983; application dated March 2, 1984; and letters dated March 25, 1984 and November 27, 1984. The Nuclear Regulatory Commission's regulations shall govern the licensee's statements in applications or letters, unless the statements are more restrictive than the regulations.

For the U.S. Nuclear Regulatory Commission

Original Signed By:

John E. Glenn

By

Nuclear Materials and Safeguards Branch
Region I

King of Prussia, Pennsylvania 19406

10 DEC 1984

Date