FORM AEC-374A
(2-65)

U. S. ATOMIC ENERGY COMMISSION
BYPRODUCT MATERIAL LICENSE
Supplementary Sheet

License Number 04-00487-03

Amendment No. 31

Department of the Navy
U.S. Naval Radiological Defense
Laboratory
San Francisco Bay Naval Shipyard
San Francisco, California 94135

License Number 04-00487-03 is hereby terminated.

For the U. S. Atomic Energy Commission
Original Signed by
(b) (6) [redacted]

Date OCT 28 1969

by Isotopes Division

Division of Materials Licensing
Washington, D. C. 20545

5

FORM AEC-374A
(2-68)

U. S. ATOMIC ENERGY COMMISSION
BYPRODUCT MATERIAL LICENSE
Supplementary Sheet

License Number 04-00487-03

Amendment No. 30

Department of the Navy
U. S. Naval Radiological Defense
Laboratory
San Francisco Bay Naval Shipyard
San Francisco, California 94135

In accordance with application dated May 9, 1969, License Number 04-00487-03 is amended as follows:

The expiration date in Item 4 is changed to March 31, 1970.

Original Signed by
(b) (6)
For the U. S. Atomic Energy Commission
Original Signed by
(b) (6)
by Isotopes Branch
Division of Materials Licensing
Washington, D. C. 20545

Date JUN 18 1969

3

FORM AEC-374A
(2-55)

U. S. ATOMIC ENERGY COMMISSION

BYPRODUCT MATERIAL LICENSE

Supplementary Sheet

License Number 04-00487-03

Amendment No. 29

Department of the Navy
U. S. Naval Radiological Defense
Laboratory
San Francisco Bay Naval Shipyard
San Francisco, California 94135

Rec'd. on 1/31/69 & called Lab., giving Amend # & date. on 1/31/69

[redacted]

License Number 04-00487-03 is amended as follows:

The expiration date in Item 4. is changed to March 31, 1969.

JAN 27 1969

Date

For the U. S. Atomic Energy Commission

Original Signed by

[redacted]

by Isotopes Branch

Division of Materials Licensing
Washington, D. C. 20545

5

FORM AEC-374C
(4-66)

U. S. ATOMIC ENERGY COMMISSION

BYPRODUCT MATERIAL LICENSE

Supplementary Sheet

License Number 04-00487-03

Amendment No. 28

Department of the Navy
U. S. Naval Radiological Defense
Laboratory
San Francisco Bay Naval Shipyard
San Francisco, California 94135

Funded To USNRDL by Stamp Forces Due 4/1/68.

In accordance with application dated December 12, 1967, License Number 04-00487-03 is amended as follows:

To Add:

6. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radioactivity which licensee may possess at any one time
X. Promethium 147	X. Promethium Oxide Pellets	X. 10,000 curies

9. Authorized use

X. Study of solubility of promethium oxide in sea water.

Condition 19. is added:

19. Byproduct material designated in Items 6.X. and 7.X. shall be used at Camp Parks, California, in accordance with statements, representations, and procedures in application dated December 12, 1967, as amended February 12, 1968.

Date MAR 27 1968

For the U. S. Atomic Energy Commission
Original Signed by
(b) (6) [redacted]
by Isotopes Branch
Division of Materials Licensing
Washington, D. C. 20545

FORM AEC-374C
(4-66)

U. S. ATOMIC ENERGY COMMISSION
BYPRODUCT MATERIAL LICENSE
Supplementary Sheet

License Number 04-00487-03

Amendment No. 27

Department of the Navy
U. S. Naval Radiological Defense
Laboratory
San Francisco Bay Naval Shipyard
San Francisco, California 94135

In accordance with application dated November 21, 1967, License Number 04-00487-03 is amended as follows:

To add:

6. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radioactivity which licensee may possess at any one time
W. Yttrium 90	W. Any	W. 15 curies

9. Authorized use

W. Research and Development as defined in Section 30.4(q), Title 10, Part 30, Code of Federal Regulations, Chapter 1, "Rules of General Applicability to Licensing of Byproduct Material."

For the U. S. Atomic Energy Commission

Original Signed by
(b) (6) [redacted]

Date DEC 12 1967

by Isotopes Branch
Division of Materials Licensing
Washington, D. C. 20545

FORM AEC-374C
(4-66)

U. S. ATOMIC ENERGY COMMISSION

BYPRODUCT MATERIAL LICENSE

Supplementary Sheet

License Number 04-00487-03

Amendment No. 26

Fwded by Stamp Form on 9/26/67.

Department of the Navy
U. S. Naval Radiological Defense Laboratory
San Francisco Bay Naval Shipyard
San Francisco, California 94135

In accordance with application dated September 6, 1967, License Number 04-00487-03 is amended as follows:

Items 6., 7., 8., and 9. are amended to add:

6. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radioactivity which licensee may possess at any one time
V. Cesium 137	V. Any	V. 20 curies

9. Authorized use

V. Research and Development as defined in Section 30.4(q), Title 10, Part 30, Code of Federal Regulations, Chapter 1, "Rules of General Applicability to Licensing of Byproduct Material."

For the U. S. Atomic Energy Commission

Original Signed By

by (b) (6) [redacted]

Isotopes Division of Materials Licensing
Washington, D. C. 20545

Date SEP 21 1967

4

FORM AEC-374C
(4-66)

U. S. ATOMIC ENERGY COMMISSION
BYPRODUCT MATERIAL LICENSE
Supplementary Sheet

License Number 04-00487-03

Amendment No. 25

Department of the Navy
U. S. Naval Radiological Defense
Laboratory
San Francisco Bay Naval Shipyard
San Francisco, California 94135

In accordance with application dated June 14, 1967, License Number 04-00487-03 is amended as follows:

To Add:

6. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radioactivity which licensee may possess at any one time
T. Chromium 51	T. Any	T. 20 curies
U. Tantalum 182	U. Any	U. 10 curies

9. Authorized use

T. and U. Research and Development as defined in Section 30.4(q), Title 10, Part 30, Code of Federal Regulations, Chapter 1, "Rules of General Applicability to Licensing of Byproduct Material."

For the U. S. Atomic Energy Commission

Original Signed By
(b) (6) [redacted]

by Isotopes Branch
Division of Materials Licensing
Washington, D. C. 20545

Date JUL 5 1967

FORM AEC-374A
(10-61)

U. S. ATOMIC ENERGY COMMISSION

MATERIAL LICENSE

Supplementary Sheet

License Number 04-00437-03

Amendment No. 24

Department of the Navy
U. S. Naval Radiological Defense
Laboratory
San Francisco Bay Naval Shipyard
San Francisco, California 94135

In accordance with with application dated May 4, 1967, License Number 04-00437-03 is amended as follows:

To Add:

6. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radioactivity which licensee may possess at any one time
R. Thulium 170 S. Thulium 171	R. Alloy Pellets S. Alloy Pellets	R. 8,000 curies S. 4,000 curies

9. Authorized use

R. and S. Research and Development as defined in Section 30.4(q), Title 10, Part 30, Code of Federal Regulations, Chapter 1, "Rules of General Applicability to Licensing of Byproduct Material."

For the U. S. Atomic Energy Commission

Original Signed By
(b) (6)

Date MAY 17 1967

by Isotopes Branch, Division of Licensing and Regulation
Washington 25, D. C.

5

FORM AEC-374A
(2-65)

U. S. ATOMIC ENERGY COMMISSION
BYPRODUCT MATERIAL LICENS
Supplementary Sheet

License Number 04-00487-03

Amendment No. 23

Department of the Navy
U. S. Naval Radiological Defense
Laboratory
San Francisco Bay Naval Shipyard
San Francisco, California 94135

Funded To NRDL by
Stamp Form on 5/9/67

In accordance with application dated March 31, 1967, License Number 04-00487-03 is amended as follows:

Add the following Conditions:

17. The licensee is authorized to use a total of 173 millicuries of Strontium 85 at Camp Parks, California, for the study of the uptake of Strontium from soil by plant crops growing in field conditions. The use of the Strontium 85 shall be in accordance with the procedures in the application dated March 31, 1967.

18. Pursuant to Section 20.302, 10 CFR 20, the licensee is authorized to bury in the soil at Camp Parks, California, a total of 1.4 millicuries of Zirconium 93 contained in 260 cubic feet of soil and 4 millicuries of Strontium 85 contained in 750 cubic feet of soil in accordance with the procedures in the application dated March 31, 1967.

For the U. S. Atomic Energy Commission

Original Signed By
(b) (6) [redacted]
by Isotopes Branch, Div. of Materials Licensing
Washington, D. C. 20545

Date MAY 4 1967

5

FORM AEC-374C
(4-66)

U. S. ATOMIC ENERGY COMMISSION

BYPRODUCT MATERIAL LICENSE

Supplementary Sheet

License Number 04-00487-03

Amendment No. 22

Department of the Navy
U. S. Naval Radiological Defense
Laboratory
San Francisco Bay Naval Shipyard
San Francisco, California 94135

Funded To Lab on 4/13/67
By Stamp Form

In accordance with application dated March 14, 1967, License Number 04-00487-03 is amended as follows:

Items 6.0., 7.0., and 8.0 are amended to read:

6. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radioactivity which licensee may possess at any one time
O. Strontium 90	O. Any	O. 300 curies
To Add:		
Q. Promethium 147	Q. Any	Q. 200 curies

9. Authorized use

Q. Research and development as defined in Section 30.4(q), Title 10, Part 30, Code of Federal Regulations, Chapter 1, "Rules of General Applicability to Licensing of Byproduct Material."

For the U. S. Atomic Energy Commission
Signed By
(b) (6) [redacted]

Date APR 12 1967

by Isotopes Branch
Division of Materials Licensing
Washington, D. C. 20545

FORM AEC-374
(7-66)
10 CFR 30

License No. 04-00487-03
Page 1 of 4 Pages

U. S. ATOMIC ENERGY COMMISSION
BYPRODUCT MATERIAL LICENSE

Amendment No. 21

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Parts 30, 32, 33, 34, and 35, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, own, possess, transfer and import byproduct material listed below; and to use such byproduct material for the purpose(s) and at the place(s) designated below. This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, and is subject to all applicable rules, regulations, and orders of the Atomic Energy Commission now or hereafter in effect and to any conditions specified below.

Licensee

1. Department of the Navy
U. S. Naval Radiological Defense Laboratory
2. San Francisco Bay Naval Shipyard
San Francisco, California 94135

In accordance with application submitted December 15, 1966

3. License number 04-00487-03 is amended in its entirety to read as follows:

4. Expiration date January 31, 1969

5. Reference No.

6. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radioactivity which licensee may possess at any one time
A. Any byproduct material with Atomic Nos. 1-84, inclusive	A. Any	A. 5 curies of each
B. Americium 241	B. Any	B. 100 millicuries
C. Americium 241	C. Monsanto Research Corporation Model MRC-G-SS-W-AM Sealed Source	C. 1 source of 2 curies
D. Americium 243	D. Any	D. 1 millicurie
E. Barium 140	E. Any	E. 100 curies
F. Californium 252	F. Any	F. 1 millicurie
G. Curium 244	G. Any	G. 1 millicurie
H. Cobalt 60	H. Sealed Sources	H. 5000 curies
I. Cesium 137	I. Sealed Sources	I. 2000 curies
J. Gold 198	J. Any	J. 200 curies
K. Hydrogen 3	K. Accelerator Targets	K. 500 curies
L. Lanthanum 140	L. Any	L. 100 curies
M. Neptunium 237	M. Any	M. 10 millicuries
N. Polonium 210	N. Sealed Polonium-Beryllium Neutron Sources	N. 100 curies
O. Strontium 90	O. Any	O. 100 curies
P. Mixed Fission Products	P. Any	P. 100 curies

9. Authorized use

A. through P. Research and Development as defined in Section 30.4(q), Title 10, Part 30, Code of Federal Regulations, Chapter 1, "Rules of General Applicability to Licensing of Byproduct Material."

CONDITIONS

10. Byproduct material may be used anywhere in the United States by U. S. Naval Radiological Defense Laboratory personnel in accordance with procedures established by the U. S. Naval Radiological Defense Laboratory Radiological Safety Committee.

11. The licensee shall comply with the provisions of Title 10, Part 20, Code of Federal Regulations, Chapter 1, "Standards for Protection Against Radiation."

12. A. (1) Each sealed source containing byproduct 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. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, the sealed source shall not be put into use until tested.

(2) Notwithstanding the periodic leak test required by the preceding paragraph, any licensed sealed source containing byproduct material is exempted from periodic leak tests provided the quantity of byproduct material contained in the source does not exceed tenntimes the quantity specified for the byproduct material in Column II, Schedule A, Section 31.100, 10 CFR 31.

(3) 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.

12. 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 sealed source or from the surfaces of the device in which the sealed source is permanently 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 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 Director, Division of Materials Licensing, U. S. Atomic Energy Commission, Washington, D. C., 20545, describing the equipment involved, the test results, and the corrective action taken. A copy of such report shall also be sent to the Director, Region V, Division of Compliance, USAEC, 2111 Bancroft Way, Berkeley, California, 94704.

D. Tests for leakage and/or contamination shall be performed by U. S. Naval Radiological Defense Laboratory personnel in accordance with procedures in application submitted December 15, 1966 or by other persons specifically authorized by the Commission or an agreement State to perform such services.

13. Each sealed source of licensed material to be used outside of a shielded exposure device shall bear a durable, legible, and visible tag permanently attached to the source. The tag shall be at least one (1) inch square, shall bear the conventional radiation symbol prescribed in Section 20.203 (a), 10 CFR 20, and a minimum of the following instructions: DANGER - RADIOACTIVE MATERIAL - DO NOT HANDLE - NOTIFY MILITARY AUTHORITIES IF FOUND. Repair or replacement of tags shall be accomplished by persons specifically licensed by the Commission or an agreement State to perform this service.

FORM AEC-374A
(2-65)

S. ATOMIC ENERGY COMMISSION
BYPRODUCT MATERIAL LICENSE
Supplementary Sheet

License Number 24-00487-03

Amendment No. 21

(continued) CONDITIONS

14. Byproduct material shall not be used in or on human beings or in products distributed to the public.

15. Pursuant to Section 20.105(a), 10 CFR 20, the licensee may permit radiation levels up to 10 milliroentgens per hour in unrestricted areas. Occupancy time shall be limited as described in memorandum dated September 1, 1961.

16. Except as specifically provided otherwise by this license, the licensee shall possess and use byproduct material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in application submitted December 15, 1966.

For the U. S. Atomic Energy Commission

Original Signed By
(b) (6) [redacted]

Date JAN 20 1967

by Isotopes Branch
Division of Materials Licensing
Washington, D. C. 20545

5

FORM AEC-374A
(10-61)

S. ATOMIC ENERGY COMMISSION

MATERIAL LICENSE

Supplementary Sheet

License Number 04-00487-03

Amendment No. 20

Department of the Navy
U. S. Naval Radiological
Defense Laboratory
San Francisco, California 94135

Funded By Stamp Form on 6/21/66

In accordance with application dated May 27, 1966, License Number 04-00487-03 is amended as follows:

Hand Carried Out By (b) (6) [redacted]

Items 6, 7, 8, and 9 are amended to read:

6. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radioactivity which licensee may possess at any one time
H. Americium 241	H. Monsanto Research Corporation Model MEC-G-SS-W-AM Sealed Source	H. 1 source of 2 curies

9. Authorized use

H. RESEARCH AND DEVELOPMENT as defined in Section 30.4(q), Title 10, Part 30, Code of Federal Regulations, Chapter 1, "Rules of General Applicability for Licensing of Byproduct Material."

JUN 17 1966

Date

For the U. S. Atomic Energy Commission

Original Signed By (b) (6) [redacted]

by Isotopes Branch
Division of Licensing and Regulation
Washington 25, D. C.

5

FORM AEC-374A
(10-61)

S. ATOMIC ENERGY COMMISSION

MATERIAL LICENSE

Supplementary Sheet

U-67-66

License Number 4-487-3
(1966)

Amendment No. 19

Rec'd 3/4/66 - Fwded Orig To NRDL by Stamp Form On 3/4/66.

Department of the Navy
U. S. Naval Radiological
Defense Laboratory
San Francisco, California 94135

In accordance with application dated January 25, 1966, License No. 4-487-3 is amended as follows:

Items 6, 7, 8, and 9 are amended to add:

6. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radioactivity which licensee may possess at any one time
G. Curium 248	G. Any	G. 1 millicurie

9. Authorized use

G. RESEARCH AND DEVELOPMENT as defined in Section 30.4(q), Title 10, Part 30, Code of Federal Regulations, Chapter 1, "Rules of General Applicability for Licensing of Byproduct Material."

For the U. S. Atomic Energy Commission

Original Signed By
(b) (6) [redacted]

Date MAR 3 1966

by Isotopes Branch
Division of Materials Licensing
Division of Licensing and Regulation
Washington 25, D. C.

5

FORM AEC-374A
(2-68)

U. S. ATOMIC ENERGY COMMISSION

BYPRODUCT MATERIAL LICENSE

Supplementary Sheet

License Number 4-487-3
(1165)

AMENDMENT NO. 18

Rec'd. 12/20/1965
& orig. fwded To NRDL
by Stamp Trim 12/20/65

(b) (6) [redacted]

Department of the Navy
U. S. Naval Radiological Defense Laboratory
Scientific and Medical Departments
San Francisco, California

In accordance with application dated November 29, 1965, License No. 4-487-3 is amended as follows:

Add the following condition:

23. The licensee may possess a maximum of 50 millicuries of byproduct material at the Vallecitos Nuclear Test Reactor, Vallecitos, California.

For the U. S. Atomic Energy Commission

Original Signed by

(b) (6) [redacted]

Date DEC 14 1965

by _____

Isotopes Branch
Division of Materials Licensing
Washington, D. C. 20545

5

FORM AEC-374A
(10-61)

S. ATOMIC ENERGY COMMISSION

MATERIAL LICENSE

Supplementary Sheet

License Number 4-487-3
(R66)

Amendment No. 17

Department of the Navy
U. S. Naval Radiological Defense Laboratory
Scientific and Medical Departments
San Francisco, California

In accordance with application dated May 7, 1965, License No. 4-487-3 is amended as follows:

Items 6, 7, 8, and 9 are amended to add:

6. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radioactivity which licensee may possess at any one time
F. Americium 243	F. Any	F. 1 millicurie

9. Authorized use

F. RESEARCH AND DEVELOPMENT as defined in Section 30.4(k), Title 10, Part 30, Code of Federal Regulations, Chapter 1, "Licensing of Byproduct Material."

For the U. S. Atomic Energy Commission

Date JUN 11 1965

Original Signed by
Isotopes Branch (b) (6) [redacted]
by Division of Materials Licensing
Division of Licensing and Regulation
Washington 25, D. C.

FORM AEC-374A
(10-61)

S. ATOMIC ENERGY COMMISSION

MATERIAL LICENSE

Supplementary Sheet

License Number 4-487-3 (E65)

Amendment No. 16

Department of the Navy
U. S. Naval Radiological Defense
Laboratory
Scientific and Medical Departments
San Francisco, California

Funded to AEC By Ser
Code 682C-166 of 28 Jan. 1965

In accordance with application dated January 5, 1965, License No. 4-487-3 is amended as follows:

Items 6.C., 7.C., and 8.C. are amended to read:

6. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radioactivity which licensee may possess at any one time
C. Americium 241	C. Any	C. 100 millicuries

~~Exauthorizing~~

For the U. S. Atomic Energy Commission

Original Signed by,
(b) (6) [redacted]

Date JAN 26 1965

by Isotopes Branch
Division of Materials Licensing
Washington 25, D. C.

5

FORM AEC-374A
(12-57)

U. S. ATOMIC ENERGY COMMISSION
BYPRODUCT MATERIAL LICENSE
Supplementary Sheet

License Number 4-487-3 (E66)

AMENDMENT NO. 15

Funded to AEC By Code 682C-960 of 12-4-64

Department of the Navy
U. S. Naval Radiological Defense Laboratory
Scientific and Medical Departments
San Francisco, California

In accordance with application dated October 28, 1964, License No. 4-487-3 is amended as follows:

Items 6.A., 7.A., and 8.A. are amended to read:

6. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radioactivity which licensee may possess at any one time
A. Any byproduct material with Atomic Nos. 1-84, inclusive	A. Any	A. 5 curies of each except: Barium 140 - 2000 curies Bromine 82 - 50 curies Cerium 144 - 2000 curies Cesium 137 - 1000 curies Cobalt 60 - 15,000 curies Gold 198 - 100 curies Hydrogen 3 - 200 curies Iridium 192 - 500 curies Lanthanum 140 - 2000 curies Lutecium 177 - 2000 curies Mercury 203 - 10 curies Rubidium 86 - 50 curies Strontium 90 - 100 curies Xenon 133 - 2000 curies Mixed Fission Products - 100 curies

For the U.S. Atomic Energy Commission

Date DEC 1 1964

by Isotopes Branch
Division of Materials Licensing
Washington 25, D. C.

ORIGINAL SIGNED BY
(b) (6) [redacted]

5

FORM AEC-374A
(10-61)

U. S. ATOMIC ENERGY COMMISSION

MATERIAL LICENSE

Supplementary Sheet

License Number 4-487-3
(R66)

Amendment No. 14

Department of the Navy
U. S. Naval Radiological Defense Laboratory
Scientific and Medical Departments
San Francisco, California

In accordance with application dated April 9, 1964, License No. 4-487-3 is amended as follows:

Items 6, 7, and 8 are amended to add:

6. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radioactivity which licensee may possess at any one time
D. Neptunium 237	D. Any	D. 10 millicuries
E. Californium 252	E. Any	E. 1 millicurie

9. Authorized use

Item 9 is amended to read:

A. through E. RESEARCH AND DEVELOPMENT as defined in Section 30.4(k) of Title 10, Part 30, Code of Federal Regulations, Chapter 1, "Licensing of Byproduct Material."

Date MAY 11 1964

For the U. S. Atomic Energy Commission

Original Signed by
(b) (6) [redacted]
Isotopes Branch
by Division of Materials Licensing
Division of Licensing and Regulation
Washington 25, D. C.

5

FORM AEC-374A
(12-57)

S. ATOMIC ENERGY COMMISSION

BYPRODUCT MATERIAL LICENSE

Supplementary Sheet

License Number 4-487-3
(H66)

This Copy is For Your Files

AMENDMENT NO. 13

Department of the Navy
U.S. Naval Radiological Defense Laboratory
Scientific and Medical Departments
San Francisco, California

In accordance with application dated January 9, 1964, and memorandum dated January 28, 1964, from Chief, Bureau of Ships, License No. 4-487-3 is amended as follows:

Conditions No. 23 and 24 are added to read:

23. Notwithstanding the requirements of Condition No. 14, any sealed source in storage is not required to be tested for leakage and/or contamination provided such sealed source is tested immediately prior to storage and on removal from storage prior to use.

24. In lieu of the control device requirements of Section 20.203(c)(2) of 10 CFR 20, the entrances to high radiation areas at source ranges at NRDL, San Francisco, California, must be under continuous surveillance and/or locked so as to make the areas inaccessible at all times when a radiation level exists therein which could cause an individual to receive a dose in excess of 100 millirem in one hour.

For the U. S. Atomic Energy Commission

(b) (6) [redacted]

Date FEB 6 1964

by Isotopes Branch
Division of Licensing and Regulation
Washington 25, D. C.

FORM AEC-374A
(10-61)

U. S. ATOMIC ENERGY COMMISSION

MATERIAL LICENSE

Supplementary Sheet

License Number 4-487-3
(H66)

Amendment No. 12

This copy is for your files

Department of the Navy
U.S. Naval Radiological Defense
Laboratory
Scientific and Medical Departments
San Francisco, California

In accordance with application dated December 5, 1963, License No. 4-487-3 is amended as follows:

Items 6, 7, 8 and 9 are amended to add:

6. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radioactivity which licensee may possess at any one time
C. Americium 241	C. Any	C. 10 millicuries

9. Authorized use

C. RESEARCH AND DEVELOPMENT as defined in Section 30.4(k) of Title 10, Part 20, Code of Federal Regulations, Chapter 1, "Licensing of Byproduct Material."

Date JAN 6 1964

For the U.S. Atomic Energy Commission

(b) (6) [redacted]

Division of Licensing and Regulation
Washington 25, D. C.

FORM AEC-374A
(10-61)

U. S. ATOMIC ENERGY COMMISSION

MATERIAL LICENSE

Supplementary Sheet

License Number 4-487-3
(1166)
Amendment No. 11

Department of the Navy
U. S. Naval Radiological Defense
Laboratory
Scientific and Medical Departments
San Francisco, California

In accordance with application dated September 27, 1963, License No. 4-487-3 is amended as follows:

Items 6, 7, 8, and 9 are amended to add:

6. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radioactivity which licensee may possess at any one time
B. Polonium 210	B. Sealed Polonium-Beryllium Neutron Sources	B. 100 curies

9. Authorized use

B. RESEARCH AND DEVELOPMENT as defined in Section 30.4(k) of Title 10, Part 20, Code of Federal Regulations, Chapter 1, "Licensing of Byproduct Material."

For the U. S. Atomic Energy Commission

Date OCT 17 1963

Original Signed by
(b) (6) [redacted]

by _____
Isotopes Branch
Division of Licensing and Regulation
Washington 25, D. C.

FORM AEC-374A
(12-57)

U. S. ATOMIC ENERGY COMMISSION
BYPRODUCT MATERIAL LICENSE
Supplementary Sheet

License Number 4-487-3
(H66)

AMENDMENT NO. 10

Department of the Navy
U. S. Naval Radiological Defense
Laboratory
Scientific and Medical Departments
San Francisco, California

In accordance with application dated August 30, 1963, License No. 4-487-3 is amended as follows:

Condition 21 is hereby deleted.

For the U. S. Atomic Energy Commission

Original Signed by
(b) (6)
by [redacted]
Licensing Branch
Washington 25, D. C.

Date SEP 19 1963

4

FORM AEC-374A
(12-57)

S. ATOMIC ENERGY COMMISSIO
BYPRODUCT MATERIAL LICEN
Supplementary Sheet

License Number 4-437-3
(1956)

362B

AMENDMENT NO. 9

Department of the Navy
U. S. Naval Radiological Defense
Laboratory
Scientific and Medical Departments
San Francisco, California

In accordance with application dated January 15, 1963, License No. 4-437-3 is amended as follows:

Condition 13 is amended to read:

13. Byproduct material shall be used by, or under the supervision of, individuals designated by the Radioisotope Committee, (b) (6) [redacted], Chairman.

Add the following condition:

22. The licensee is authorized to perform tests for leakage and/or contamination upon sealed sources at Department of Defense agencies in accordance with procedures contained in application dated January 15, 1963. The test so conducted, when properly reported to and recorded by the Department of Defense agency, shall be deemed to satisfy the licensing requirement of a periodic leak test by persons specifically authorized by the Commission to perform such services.

For the U. S. Atomic Energy Commission

Date FEB 12 1963

by Deleted Signed by (b) (6) [redacted]
Division of Licensing and Regulation
Washington 25, D. C.

S

FORM AEC-374A (10-57)

U. S. ATOMIC ENERGY COMMISSION

BYPRODUCT MATERIAL LICENSE

Supplementary Sheet

License Number 4-487-3 (RM6)

AMENDMENT NO. 8

Department of the Navy
U. S. Naval Radiological Defense Laboratory
Scientific and Medical Departments
San Francisco, California

Attention: (b) (6) [redacted], Chairman
Radioisotope Committee

In accordance with application dated August 3, 1962, License No. 4-487-3 is amended as follows:

Items 6A, 7A and 8A are amended to read:

5. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radioactivity which licensee may possess at any one time
A. Any byproduct material with Atomic Nos. 1-84, inclusive	A. Any	A. 5 curies of each except: Barium 140 - 2000 curies Bromine 82 - 50 curies Cerium 144 - 200 curies Cesium 137 - 1000 curies Cobalt 60 - 13000 curies Hydrogen 3 - 200 curies Iridium 192 - 500 curies Lanthanum 140 - 2000 curies Lutecium 177 - 2000 curies Mercury 203 - 10 curies Strontium 90 - 100 curies Xenon 133 - 1000 curies Mixed Fission Product - 100 curies

For the U. S. Atomic Energy Commission

Date _____

by Isotopes Branch
Division of Licensing and Regulation
Washington 25, D. C.

AM AEC-374A

ATOMIC ENERGY COMMISSION

BYPRODUCT MATERIAL LICENSE

Supplementary Sheet

Page 1 of

License Number 4-487-3
(H66)

Amendment No. 7

Department of the Navy
U.S. Naval Radiological Defense
Laboratory
Scientific and Medical Departments
Francisco, California

Attention: (b) (6) [redacted] Chairman
Radioisotope Committee

In accordance with application dated February 15, 1962, License No. 4-487-3 is amended as follows:

The following condition is added:

21. Notwithstanding the provisions of Condition 14E, the Cobalt 60 source identified as Cobalt 60 source # 105 may be used in accordance with the conditions specified in the application dated February 15, 1962.

For the U. S. Atomic Energy Commission

Date March 2, 1962

by Isotopes Branch
Division of Licensing and Regulation
Washington 25, D. C.

FORM AEC 374A

U.S. ATOMIC ENERGY COMMISSION
BYPRODUCT MATERIAL LICENSE
Supplementary Sheet

License Number 4-487-3
(H66)

Amendment No. 6

Department of the Navy
U.S. Naval Radiological Defense
Laboratory
Scientific and Medical Departments
San Francisco, California

Attention: (b) (6) [redacted], Chairman
Radioisotope Committee

In accordance with memorandum dated September 1, 1961, License No. 4-487-3 is amended as follows:

Add the following condition:

20. Pursuant to Section 20.105(a), 10 CFR 20, the licensee may permit radiation levels up to 10 milliroentgens per hour in unrestricted areas. Occupancy time shall be limited as described in memorandum dated September 1, 1961.

For the U.S. Atomic Energy Commission

Date October 2, 1961

by Chief, Isotopes Branch
Division of Licensing and Regulation
Washington 25, D. C.

U.S. ATOMIC ENERGY COMMISSION
BYPRODUCT MATERIAL LICENSE NO. 4-487-3 AMENDMENT (866)

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 2, Licensing of Byproduct Material, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, own, possess, transfer and import byproduct material listed below, and to use such byproduct material for the purpose(s) and at the place(s) designated below. This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954 and is subject to all applicable rules, regulations, and orders of the Atomic Energy Commission now or hereafter in effect and to any conditions specified below.

Licensee	
1. Name: Department of the Navy U.S. Naval Radiological Defense Laboratory	In accordance with application dated 2/24/[illegible] as amended by letter dated May 16, 1961
2. Address: Scientific and Medical Departments San Francisco, California	3. License number 4-487-3 is amended in its entirety to read as follows:
	4. Expiration date: August 31, 1966
	5. Reference No.

6. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radioactivity which licensee may posses at any one time
(See page 2)	(See page 2)	(See page 2)

9. Authorized use

(See page 2)

CONDITIONS

10. Unless otherwise specified, the authorized place of use is the licensee's address stated in Item 2 above.

11. Byproduct materials may also be used at Navy, Army, and Air Force facilities provided such use is under the direct supervision and control of U.S. Naval Radiological Defense Laboratory personnel and in accordance with procedures established by the Radioisotope Committee of the U.S. Naval Radiological Defense Laboratory.

12. The licensee shall comply with the provisions of Title 10, Part 20, Code of Federal Regulations, Chapter 1, "Standards for Protection Against Radiation".

13. Byproduct materials shall be used by, or under the supervision of, individuals designated by the Radioisotope Committee, (b) (6) [redacted], Chairman.

14. A. Each sealed source acquired from another person and containing byproduct material with a half-life greater than 30 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 6 months prior to the transfer, the sealed source shall not be put into use until tested.

(See page 2)

(1) to Sec 362-478

License Number 4-487-3
(H06)

Amendment No. 5

CONTINUED:

6. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radioactivity which licensee may possess at any one time
A. Any byproduct material with Atomic Nos. 1 - 84, inclusive.	A. Any	A. 5 curies of each except: Barium 140 - 2000 curies Bromine 82 - 50 curies Cesium 137 - 1000 curies Cobalt 60 - 15,000 curies Hydrogen 3 - 200 curies Iridium 192 - 500 curies Lanthanum 140 - 2000 curies Lutecium 177 - 2000 curies Mercury 203 - 10 curies Strontium 90 - 100 curies Xenon 133 - 2000 curies Mixed Fission Products - 100 curies

9. Authorized use

A. RESEARCH AND DEVELOPMENT as defined in Section 30.4(k) of Title 10, Part 20, Code of Federal Regulations, Chapter 1, "Licensing of Byproduct Material".

CONDITIONS

B. Each sealed source fabricated by the licensee shall be tested for contamination and/or leakage immediately after fabrication. If the test reveals the presence of 0.005 microcuries or more of removable contamination, the licensee shall repair and/or decontaminate and retest the source. Sealed sources fabricated for distribution and containing byproduct material (with the exception of solid metallic Iridium 192, byproduct material with a half-life not exceeding thirty days, and byproduct material in the form of gas) shall, in addition to an initial test upon fabrication, be stored for a period of seven days and retested prior to being distributed.

C. Each sealed source containing byproduct material with a half-life greater than 30 days and in any form other than gas, shall be tested for leakage and/or contamination at intervals not to exceed 6 months, except that sources designed as an alpha emitting source shall be tested at intervals not exceeding 3 months.

(See page 3)

FORM AEC-374A

ATOMIC ENERGY COMMISSION
PRODUCT MATERIAL LICENSE
Supplementary Sheet

License Number 4-487-3 (E66)

Amendment No. 5

CONTINUED:

CONDITIONS

D. The test shall be capable of detecting the presence of 0.005 microcuries of removable contamination on the test sample. The test sample shall be taken from the sealed source or from appropriate accessible surfaces of the device in which the sealed source is permanently or semipermanently mounted or stored. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission.

E. If the test required in A or C above reveals the presence of 0.005 microcuries 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 five days of the test with the Director, Division of Licensing and Regulation, U.S. Atomic Energy Commission, Washington 25, D.C., describing the equipment involved, the test results and the corrective action taken. A copy of such report shall be sent to the manager of the nearest AEC operations office listed in Appendix D of Title 10, Code of Federal Regulations, Part 20.

15. Each sealed source of licensed material to be used outside of a shielded exposure device shall bear a durable, legible and visible tag permanently attached to the source. The tag shall be at least one (1) inch square, shall bear the conventional radiation symbol prescribed in Section 20.203(a) of Part 20 and a minimum of the following instructions: DANGER, RADIOACTIVE MATERIAL, DO NOT HANDLE, NOTIFY MILITARY AUTHORITIES IF FOUND.

16. Byproduct material shall not be used in or on human beings.

17. Pursuant to Section 20.302, 10 CFR 20, byproduct materials with physical half-lives of 90 days or less may be disposed of by storage and decay in roped off and posted restricted areas.

18. Pursuant to Section 20.103(c), 10 CFR 20, individuals in restricted areas may be exposed to airborne concentrations of byproduct material in excess of the limits specified in Appendix B, Table I, provided that the protective equipment described in Appendix A and Appendix B to application dated February 24, 1961 is utilized.

19. Except as otherwise specifically provided for in the license, the licensee shall possess and use byproduct material described in Items 6, 7 and 8 of this license in accordance with statements, representations, and procedures contained in his application dated February 24, 1961 as amended by letter dated May 16, 1961.

For the U. S. Atomic Energy Commission

Date August 8, 1961

By Chief, Isotopes Branch
Division of Licensing and Regulation
Washington 25, D. C.

FORM AEC-374A
(12-57)

U. S. ATOMIC ENERGY COMMISSION
BYPRODUCT MATERIAL LICENSE
Supplementary Sheet

License Number 4-487-3
(C61)

AMENDMENT NO. 4

Department of the Navy
U.S. Naval Radiological Defense
Laboratory
Scientific and Medical Departments
San Francisco, California

Attention: (b) (6) [redacted] Chairman
Radioisotope Committee

In accordance with letters dated January 8, 1960 signed by (b) (6) [redacted] and letter dated March 28, 1960 signed by (b) (6) [redacted], License No. 4-487-3 is amended as follows:

Add the following conditions:

24. Notwithstanding the provisions of Section 20.101, 10 CFR 20, personnel engaged in special field decontamination tests utilizing Barium 140 - Lanthanum 140 may receive a radiation dose in excess of three times the limit specified in Appendix A, 10 CFR 20 in seven consecutive days provided no person receives a radiation dose in excess of ten times the limit specified in Appendix A, 10 CFR 20, in any consecutive thirteen weeks.

25. In accordance with Section 20.302, 10 CFR 20, Barium 140 - Lanthanum 140 may be disposed of by storage and decay in roped off and posted restricted areas.

For the U. S. Atomic Energy Commission

Date April 29, 1960

by Chief, Isotopes Branch
Division of Licensing and Regulation
Washington 25, D. C.

FORM AEC-374A

U. S. ATOMIC ENERGY COMMISSION

BYPRODUCT MATERIAL LICENSE

Supplementary Sheet

License Number 4-487-3 (C61)

AMENDMENT NO. 3

Department of the Navy
U. S. Naval Radiological Defense Laboratory
Scientific and Medical Departments
San Francisco 24, California

Attention: (b) (6) [redacted], Chairman
Radioisotope Committee

In accordance with letter dated August 5, 1959, License No. 4-487-3 is amended as follows:

Items 6A, 6B, 7A, 7B, 8A, and 8B are amended to read:

6. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radioactivity which licensee may possess at any one time
A. Hydrogen 3	A. Any	A. 100 curies
B. Any byproduct material with Atomic No. 3 - 84, inclusive.	B. Any	B. 5 curies of each except: Cobalt 60 - 5000 curies Cesium 137 - 750 curies Mercury-203 - 10 curies Iridium 192 - 500 curies Barium 140 - 1000 curies Lanthanum 140 - 1000 curies Strontium 90 - 100 curies Mixed Fission Products - 100 curies.

Condition 17 is hereby deleted:

For the U. S. Atomic Energy Commission

Date September 3, 1959

by Chief, Isotopes Branch
Division of Licensing and Regulation
Washington 25, D. C.

Encl 1 to BUSHIPS
Ser 341-100

U.S. ATOMIC ENERGY COMMISSION

PRODUCT MATERIAL LICENSE [illegible]-487-3, AMENDMENT NO. [illegible]

[illegible]

Licensee

Name	Department of the Navy	[illegible]	In accordance with application dated November 25, 19[illegible], [illegible]
	U. S. Naval Radiological Defense		[illegible]
Address	[illegible]	[illegible]	[illegible]
	[illegible] Medical Department		[illegible]
	San Francisco 24, California		[illegible]
[illegible]	[illegible]		Maximum amount of radioactive [illegible]
[illegible]			[illegible]
[illegible]	A. Ary		[illegible]
[illegible]	(See Page 2)		(See Page 2)

[illegible] RESEARCH AND DEVELOPMENT as defined in Section [illegible] of Title 10, Part 30, Code of Federal Regulations, Chapter 1, "Licensing of Byproduct Material".

CONDITIONS

[illegible]

[illegible] at Navy, Army, and [illegible] Facilities [illegible] the direct supervision and control of [illegible] Radiological [illegible] in accordance with the [illegible] established [illegible] the U. S. Naval Radiological [illegible]

The licensee shall comply with the provisions of Title 10, Part 20, Code of Federal Regulations, Chapter 1, "Standards for Protection Against Radiation".

Byproduct material shall be used by, or under the direct supervision of, individual [illegible] by the Radioisotope Committee, [illegible] Baletti, Chairman.

Byproduct material as sealed sources shall not be opened. The term "sealed source" shall not [illegible] byproduct material sealed in containers for irradiation and transit [illegible].

(See Page 2)

For the U. S. Atomic Energy Commission

[illegible]

U. S. ATOMIC ENERGY COMMISSION

BYPRODUCT MATERIAL LICENSE

Supplementary Sheet

License Number 4-487-3
(C61)

AMENDMENT NO. 2

CONTINUED:

6. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radioactivity which licensee may possess at any one time
A. Any byproduct material from Atomic No. 3-84, inclusive	A. Any	B. 500 millicuries of each except: Carbon 14 - 1 curie Cobalt 60 - 5,000 curies Cesium 137 - 750 curies Mercury 203 - 10 curies Iridium 192 - 500 curies Lanthanum 140 - 500 curies Phosphorus 32 - 1 curie Strontium 90 - 100 curies Mixed Fission Products - 100 curies

CONDITIONS

9. Sealed sources containing byproduct material (except solid metal Iridium 192; Tantalum 182, Cobalt 60 plated with gold or nickel; and gases) shall be tested for leakage and contamination at intervals of not more than six (6) months and records of test results shall be maintained by the licensee.

10. Each sealed source of licensed material to be used outside of a shielded exposure device shall be acquired from the supplier with a durable, legible and visible tag permanently attached. The tag shall be attached directly to the source or attached by a durable chain or leader. The tag shall be at least one inch square, shall bear a conventional radiation symbol and a minimum of the following instructions: "Danger - Radioactive Material, Do Not Handle, Notify Military Authorities if Found".

11. Total amount of Hydrogen 3 (tritium) acquired under this license shall not exceed 50 curies.

12. Byproduct material shall not be used in or on human beings.

13. Byproduct material shall not be used in products distributed to the public.

14. Byproduct material shall not be used in field applications where activity is released.

(Page 3)

For the U. S. Atomic Energy Commission

Date March 17, 1959

By Chief, Isotopes Branch
Division of Licensing and Regulation
Washington 25, D. C.

U. S. ATOMIC ENERGY COMMISSION

BYPRODUCT MATERIAL LICENSE

Supplementary Sheet

License Number 6-487-3
(C61)

AMENDMENT NO. 2

CONTINUED:

CONDITIONS

21. A curie of Iridium 192 is defined as that quantity of activity which presents a radiation intensity of 0.55 roentgen per hour at a distance of one meter.

22. The licensee shall possess and use byproduct material described in Items 6, 7 and 8 of this license in accordance with statements, representations, and procedures contained in his application dated November 25, 1958, and in related documents and amendments as follows:

A. ACCOUNTABILITY AND HEALTH PHYSICS MEASURES FOR BYPRODUCT MATERIALS AT USNRDL.

23. Instructions referenced in Condition 22.A. covering radiological protection, control, and security of byproduct material shall be followed and a copy of instructions shall be supplied to each individual using or having responsibility for use of such material. Any changes in the instructions shall have the prior approval of the Isotopes Branch, Division of Licensing and Regulation.

For the U.S. Atomic Energy Commission

Date March 17, 1959 by Chief, Isotopes Branch
Division of Licensing and Regulation

U. S. NAVAL RADIOLOGICAL DEFENSE LABORATORY
SAN FRANCISCO, CALIFORNIA 94135

IN REPLY REFER TO:

730-74
(b) (6) [redacted]
16 FEB 1967

Recd. - 2/21/67

Mr. (b) (6) [redacted]
Chief, Enforcement Branch
Division of State and
Licensee Relations
U. S. Atomic Energy Commission
Washington, D. C. 20545

Dear Mr. (b) (6) [redacted]:

As requested by your letter of February 10, 1967, (Ref. SLR:RH, 4-487-3), we have enclosed a copy of the Leaking Source Report Form with the information entered for Items 7 and 12 as you have indicated.

Very truly yours,

(b) (6) [redacted]
Head, Health Physics
Division

Enclosure (1)
Leaking Source Report Form

Copy to:
Commander, NESC
Baileys Crossroads, Virginia 22041
Attn: (b) (6) [redacted] Code 05163

10330
670426
A730
901
214C

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

IN REPLY REFER TO:
SLR:RH
4-487-3

FEB 10 1967

YOUR REF: 730-60
(b) (6)

U. S. Naval Radiological
Defense Laboratory
San Francisco, California 94135

Attention: Mr. (b) (6)

Gentlemen:

Thank you for your letter of December 19, 1966, which we received on January 6, 1967, informing us of a leak test which revealed the presence of removable contamination on a cobalt 60 source. So that our records will be complete, we will appreciate your completing those portions of the enclosed form which we have marked and returning one copy of the completed form to us.

Very truly yours,

(b) (b) (6)

Chief
Enforcement Branch
Division of State and
Licensee Relations

Enclosure:
Leaking Source Report Form

cc: Commander
Naval Electronics Systems Command
Baileys Crossroads, Virginia 22041
Attention: Mr. (b) (6)
Code: 0516

AIR MAIL

FEB 13 11 37 AM '67

Leaking Source Report

G70426

1) Name of Source Manufacturer _____

2) Source Model No. _____

3) Source Serial No., if known _____

4) Model number and manufacturer of device in which source was used, if any. _____

5) Radioisotope _____

6) Amount of Radioactivity in Source _____

7) Date Source Received 27 February 1963

8) Amount of Removable Contamination Found _____ microcuries

9) Date of Leak Test _____

10) Action taken immediately following leak test with respect to withdrawal of equipment from use and the decontamination, repair or disposal of equipment.

11) Type of equipment and physical conditions under which source was used.

12) Apparent or suspected cause of source failure.
The suspected cause of failure is a possible leak in the stainless steel cladding or its welded seams. This flow may have been present from the time of encapsulation but did not produce an above-limit source of contamination until the recent leak test.

NAME U. S. Naval Radiological Defense Laboratory

ADDRESS San Francisco, California 94135

9-63

LICENSE NO. By-Product Material License No. 14-4878

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

IN REPLY REFER TO:
SLR:RH
4-487-3

FEB 10 1967

Rec'd: 2/14/67

YOUR REF: 730-60
(b) (6) [redacted]

U. S. Naval Radiological
Defense Laboratory
San Francisco, California 94135

Attention: Mr. (b) (6) [redacted]

Gentlemen:

Thank you for your letter of December 19, 1966, which we received on January 6, 1967, informing us of a leak test which revealed the presence of removable contamination on a cobalt 60 source. So that our records will be complete, we will appreciate your completing those portions of the enclosed form which we have marked and returning one copy of the completed form to us.

Very truly yours,

(b) (6) [redacted] Chief
Enforcement Branch
Division of State and
Licensee Relations

Enclosure:
Leaking Source Report Form

cc: Commander
Naval Electronics Systems Command
Baileys Crossroads, Virginia 22041
Attention: Mr. (b) (6) [redacted]
Code: 0516

AIR MAIL

Leaking Source Report

1) Name of Source Manufacturer _____

2) Source Model No. _____

3) Source Serial No., if known _____

4) Model number and manufacturer of device in which source was used, if any. _____

5) Radioisotope _____

6) Amount of Radioactivity in Source _____

7) Date Source Received _____

8) Amount of Removable Contamination Found _____ microcuries

9) Date of Leak Test _____

10) Action taken immediately following leak test with respect to withdrawal of equipment from use and the decontamination, repair or disposal of equipment.

_____

_____

_____

_____

11) Type of equipment and physical conditions under which source was used.

_____

_____

_____

_____

12) Apparent or suspected cause of source failure.

_____

_____

_____

_____

NAME _____

ADDRESS _____

LICENSE NO. _____

9-63

ELEX-0516
9600
Ser 05163-43
7 February 1967

From: Commander, Naval Electronic Systems Command
To: Director
Division of Nuclear Materials Management
U. S. Atomic Energy Commission
Washington, D. C. 20545

Subj: Plutonium-Beryllium Sources; Request For Authorization To Obtain

Encl: (1) USNRDL letter Ser 730-70,AK:kmm of 27 January 1967

1. Enclosure (1) contains information relative to subject material and a copy of U. S. Naval Radiological Defense Laboratory's purchase order for two neutron sources.

2. The Laboratory developed the AN/UDM-5 Neutron Calibrator which uses the 80 gram plutonium-beryllium source. Twenty of the calibrators have been constructed to date. The calibrators are used aboard nuclear submarine tenders and at Naval Shore Facilities. The associated Pu-Be have been issued to the Navy by the Atomic Energy Commission in accordance with the Atomic Energy Act of 1954.

3. Two additional AN/UDM-5 Neutron Calibrators are under construction by the Laboratory. It is requested that authority be issued for transfer of the two 80 gram plutonium-beryllium sources to the Navy under Section 91b of the Atomic Energy Act of 1954.

4. It is further requested that a copy of the authorization for transfer be forwarded to the Naval Electronic Systems Command, Code 05163, Washington, D. C., in addition to a copy for the Laboratory.

Copy to:
BUMED (Code 74)
NRDL, SFRAN

(b) (6) [redacted]
By direction

MAHAFFEY/mitchell
64157 - 2/7/67
Serial 670201-7544

U. S. NAVAL RADIOLOGICAL DEFENSE LABORATORY
SAN FRANCISCO, CALIFORNIA 94135

IN REPLY REFER TO:
730-70
AK:kmm

27 JAN 1967

AIRMAIL

Rec'd. 2/2/67

From: Commanding Officer and Director
To: Commander, Naval Electronics System Command
(Code 05163), 18th and Constitution Avenues,
Washington, D. C. 20390

Fwded. To AEC as Encl 1, to NAVELEX Ltr., Code 05163-___ of Feb. 1967

Subj: Plutonium-Beryllium Sources; request for authorization to obtain

Ref: (a) NAVSHIPSYSCOM ltr 9673 ELEX 0516 Ser 05162-496 of 10 Oct 1965

Encl: (1) NRDL Purchase Order of N0044567(62479)7016-0596 dtd 19 Jan 1967 with Nuclear Materials and Equipment Corporation (2 copies)

1. Reference (a) directed NRDL to construct two additional neutron flux generators.

2. Two (2) 80 gram plutonium-beryllium sources will be required to complete the units. It is therefore requested that authority be issued for transfer of these sources to the Department of the Navy under Section 91b of the Atomic Energy Act of 1954.

3. These sources are to be supplied by the Nuclear Materials and Equipment Corporation (NUMEC), Apollo, Pennsylvania (Enclosure (1)) from their Special Nuclear Material License SNM-414.

(b) (6)

By direction

Copy to: (w/encl (1))
Region V, Materials Management Branch, USAEC, SFOO
NUMEC, Apollo, Pa.

TALLY NO. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

PG 1 OF 1	ORDER/RECEIPT NO. N0044567(62479)7016-0596	CONTRACT NO.	**ORDER FOR SUPPLIES OR SERVICES**
DO RATING *	DATE OF ORDER 1/19/67	REQUISITION NO./PURCHASE AUTHORITY	DISCOUNT TERMS Net 30 Days
ISSUED BY SUPPLY OFFICER SAN FRANCISCO BAY NAVAL SHIPYARD SAN FRANCISCO, CALIFORNIA 94135		MAIL INVOICES TO CODE 252 USNRDL SAN FRANCISCO BAY NAVAL SHIPYARD SAN FRANCISCO, CALIFORNIA 94135	DELIVERY F.O.B. Apollo, PA. ☐ DESTINATION ☑ OTHER (See schedule)
SHIP TO RECEIVING OFFICER HUNTERS POINT, BLDG. 815 SAN FRANCISCO BAY NAVAL SHIPYARD SAN FRANCISCO, CALIFORNIA 94135		PAYMENT WILL BE MADE BY [x] NRFC, NAVAL SUPPLY CENTER Oakland, California [ ] SEE BELOW	DELIVER TO F.O.B. POINT ON OR BEFORE SEE BELOW
TO (Contractor and address) Nuclear Materials & Equipment Corp. P. O. Box 266 Apollo, Pennsylvania Shake/GRover 2-2411		PAYMENT ☐ COMPLETE ☐ PARTIAL ☐ FINAL	D.O. VOUCHER NO. PAID BY:

TYPE OF ORDER

☑ PURCHASE — Reference your please furnish the following on the terms specified on both sides of this order and on the attached sheets, if any, including delivery as indicated. This purchase is negotiated under authority of 10 U.S.C. 2304(a)(3) if within the U.S., its possessions or Puerto Rico; if otherwise, under 2304(a)(6).

☐ DELIVERY — This delivery order is subject to instructions contained on this side only of this form and is issued on another government agency or in accordance with and subject to the terms and conditions of the above-numbered contract.

☐ CASH — This cash purchase receipt is subject to instructions contained on this side only of this form.

FOLD

MARK ALL PACKAGES AND PAPERS WITH CONTRACT AND/OR ORDER NUMBER

THE UNITED STATES OF AMERICA

BY: (b) (6) [redacted]

Contracting/Ordering Officer

Pr-14 mm

ACCOUNTING AND APPROPRIATION DATA-ACCOUNTING CLASSIFICATION (REVISED 5-59)

Item No.	Appropriation Symbol and Subhead	Object Class	Expenditure Account	Chargeable Activity	Bu. Cont./Sub-auth'n Act'y	Bureau Control No.	Sub-auth'n No.	Identification No.	Amount
	17X1319 2475	260	98178/-	445	2D	-	008262	091559	

ITEM NO.	QUANTITY (No. units)	UNIT	UNIT PRICE	SCHEDULE OF SUPPLIES OR SERVICES	AMOUNT	QUANTITY ACCEPTED
The attached clauses apply to this order as follows: No. 4 and 7						
				Radioisotope:		
1	2	Ea	1,065.00	Plutonium Beryllium, 80 gram, 5 curie, Type NUMEC-H, Size 1.31 inches dia. X 2.72 inches high	2,130.00	
2	2	Ea	60.00	Shipping Container Stub Nr: 6247970160596 Special Nuclear Material License: SNM-35 NOTE: Do Not Ship Sources Until AEC Approval Requested by Navelex is Received	120.00	
CC 252-14		6710-1	5318-1			
					$2,250.00	TOTAL
						DIFFERENCES
						INITIALS

CHECK NO. OR ☐ CASH

DATED

FOR (Amount)

I CERTIFY that this account is correct and proper for payment.

PAYEE (Sign original only) (☐ Paid in cash ☐ As an invoice)

BY

TITLE

AMOUNT VERIFIED CORRECT FOR

(Signature and title of Certifying Officer)

SHIPMENT NUMBER

☐ FINAL ☐ PARTIAL

RECEIVED AT

S/R ACCOUNT NO.

S/R VOUCHER NO.

Quantities in "Quantity Accepted" column have been

☐ INSPECTED ☐ RECEIVED ☐ ACCEPTED

by me and conform to contract. Items listed on reverse side have been rejected for reasons indicated.

DATE RECEIVED

TOTAL CONTAINERS

STORAGE LOCATION

LOCATION

GROSS WEIGHT

B/L NO.

RECEIVED BY

(Date & signature of authorized U.S. Gov't representative)

* Certified for National Defense use under DMS Reg. 1

SEE REVERSE SIDE FOR REJECTIONS

DD FORM 1 APR 64 1155 (2-PT.) (NAVY) 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

EDITION OF 1 MAY 63 MAY BE USED UNTIL EXHAUSTED.

12ND SFBNS 2029 (REV. 10-66)

Form approved by Comp. Gen., U.S. 13 Dec. 1960

HLEX-0516
3350
Ser 05163-4
6 January 1967

FIRST ENDORSEMENT ON NRDL LETTER SER 730-57/EJD/ALS:KMM OF 15 DECEMBER 1966

From: Commander, Naval Electronic Systems Command
To: Chief, Isotopes Branch
Division of Materials Licensing
U. S. Atomic Energy Commission
Washington, D. C. 20545

Subj: AEC Byproduct Material License No. 4-487-3; Request For Renewal Of

1. Basic letter with enclosure contains an application for renewal of subject license.

2. The completed AEC Form-313 with updated supplemental information in its entirety has been reviewed and covers the byproduct materials used in the Laboratory's Basic and Applied Research Programs.

3. This application cancels and supersedes the application dated 29 July 1966 which was submitted by the Naval Electronic Systems Command's FIRST ENDORSEMENT of 8 August 1966.

Copy to:
BUMED (Code 74)
NRDL, SFRAN

(b) (6) [redacted]
By Direction

(b) (6) [redacted]
61457 - 1/6/67
Serial 661219-5798

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

(04-00487-03)

DEC 29 1969

Rec'd: 1/6/70

Commanding Officer
U. S. Naval Radiological
Defense Laboratory
San Francisco, California 94135

Dear Sir:

This refers to your inquiry of May 9, 1969, (your reference 730-ALS:kmm) concerning AEC requirements for your retention of records relating to your AEC-licensed operations.

We understand that the records of individual radiation exposure, which you have maintained pursuant to paragraphs 20.401(a) and (c) of 10 CFR Part 20, will be preserved in the individual personnel records.

You will not be required to continue, after Laboratory closure and subsequent termination of your license, the maintenance of other records such as those mentioned in paragraph 3 of your inquiry.

Sincerely,

Original Signed by
(b) (6)
Director
Division of Materials Licensing

cc: Commander, Naval Electronic
Systems Command, Washington, DC

U. S. NAVAL RADIOLOGICAL DEFENSE LABORATORY
SAN FRANCISCO, CALIFORNIA 94135

IN REPLY REFER TO:
730
ALS:kmm
9 May 1969

From: Commanding Officer
To: Chief, Isotope Branch, Division of Materials Licensing, U. S. Atomic Energy Commission, Washington, D. C. 20545
Via: Commander, Naval Electronic Systems Command, (Code 05163), Munitions Building, Room 4713, Nucleonics Branch, 18th and Constitution Avenues, Washington, D. C. 20390

Subj: AEC Byproduct Material License No. 04-00487-03; information concerning

1. Reference is made to a phone conversation between Mr. (b) (6) of the DML and Mr. (b) (6) of NRDL on April 7, concerning programs, use locations and possession limits for byproduct materials used under the subject license.

2. As outlined by a later phone conversation on 1 May 1969, the usage of byproduct material under the subject license will undergo a drastic change in the downward direction due to the planned closure of this Laboratory by 31 December 1969. Accordingly, it is requested that a one-year extension of the existing license be granted. Starting 1 July 1969, the main activities will be the disposition and transfer to other licensed activities of all byproduct materials held under the license.

3. In addition, information is requested as to AEC requirements for, after Laboratory closure, maintenance of past records relating to the several licenses held by NRDL, e.g., monitoring surveys, air samples, source wipes, radiological safety committee actions, photodosimetry, etc.

(b) (6)
By direction

9900
Ser 306 - 0516
27 OCT 1969

FIRST ENDORSEMENT ON NRDL LETTER 101-78 JJM/WEC:rpg OF 27 OCT 1969

From: Commander, Naval Electronic Systems Command
To: Chief, Isotopes Branch
Division of Material Licensing
U. S. Atomic Energy Commission
Washington, D. C. 20545

Subj: AEC Byproduct Material Licenses

1. Basic letter contains a request to terminate license No. 04-00487-03 and an enclosure with attachments covering an application for a license for the NRDL (Naval Radiological Defense Laboratory) Disestablishment Group.

10/25/01 - (b) (6)

Copy to:
BUMED(Code 74)
NRDL, SFRAN

(b) (6)
By direction

(b) (6)
61457 - 10-27-69
Serial 1027-049-69

Word From Mr. (b) (6) on 10/28/69 - 2:15
lic # assigned is 04-13488-01.
The amendment has likewise been prepared which terminates license # 04-00487-03.
The documents are in preparation - should be typed, signed & in mail by 6 Nov

U. S. NAVAL RADIOLOGICAL DEFENSE LABORATORY
SAN FRANCISCO, CALIFORNIA 94135

IN REPLY REFER TO:
101-78
(b) (6)
27 OCT 1969

From: Commanding Officer
To: Chief, Isotopes Branch, Division of Material Licensing; U.S. Atomic Energy Commission
Via: Commander, Naval Electronic Systems Command (ELEX 05163)

Subj: AEC Byproduct Material Licenses; Request for Termination of; Application for

Encl: (1) NRDL Disestablishment Group Application for Byproduct Material License dated 27 Oct. 1969

1. It is requested that AEC Byproduct Material License 4-487-3 be terminated.

2. Responsibility for decontamination of all NRDL buildings is to be assumed by the NRDL Disestablishment Group in accordance with a license issued pursuant to enclosure (1).

(b) (6)
By direction

Copy to:
BUMED (Code 74) (w/o encl)
NAVMAT (MAT 0331) " "
COMNAVSHIPYD (MI) " "
SFBNSY (H101) " "
" (H710) (w/encl)
" (MI142) "

Form AEC-313
(5-58)

ATOMIC ENERGY COMMISSION

APPLICATION FOR BYPRODUCT MATERIAL LICENSE

Form approved.
Budget Bureau No. 38-R027.4.

INSTRUCTIONS.—Complete Items 1 through 16 if this is an initial application. If application is for renewal of a license, complete only Items 1 through 7 and indicate new information or changes in the program as requested in Items 8 through 15. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail three copies to: U. S. Atomic Energy Commission, Washington 25, D. C. Attention: Isotopes Branch, Division of Licensing and Regulation. Upon approval of this application, the applicant will receive an AEC Byproduct Material License. An AEC Byproduct Material License is issued in accordance with the general requirements contained in Title 10, Code of Federal Regulations, Part 30 and the Licensee is subject to Title 10, Code of Federal Regulations, Part 20.

1. (a) NAME AND STREET ADDRESS OF APPLICANT. *(Institution, firm, hospital, person, etc.)*

Department of the Navy
NRDL Disestablishment Group
San Francisco, California 94130

(b) STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED: *(If different from 1 (a).)*

San Francisco Bay Naval Shipyard
Hunter's Point Division

2. DEPARTMENT TO USE BYPRODUCT MATERIAL

NRDL Disestablishment Group

3. PREVIOUS LICENSE NUMBER(S). *(If this is an application for renewal of a license, please indicate and give number.)*

4-487-3

4. INDIVIDUAL USER(S). *(Name and title of individual(s) who will use or directly supervise use of byproduct material. Give training and experience in Items 8 and 9.)*

Mr. [redacted]

5. RADIATION PROTECTION OFFICER *(Name of person designated as radiation protection officer if other than individual user. Attach resume of his training and experience as in Items 8 and 9.)*

Mr. [redacted]

6. (a) BYPRODUCT MATERIAL. *(Elements and mass number of each.)*

See Attachment 1

(b) CHEMICAL AND/OR PHYSICAL FORM AND MAXIMUM NUMBER OF MILLICURIES OF EACH CHEMICAL AND/OR PHYSICAL FORM THAT YOU WILL POSSESS AT ANY ONE TIME. *(If sealed source(s), also state name of manufacturer, model number, number of sources and maximum activity per source.)*

See Attachment 1

7. DESCRIBE PURPOSE FOR WHICH BYPRODUCT MATERIAL WILL BE USED. *(If byproduct material is for "human use," supplement A (Form AEC-313a) must be completed in lieu of this item. If byproduct material is in the form of a sealed source, include the make and model number of the storage container and/or device in which the source will be stored and/or used.)*

See Attachment 1

ENCLOSURE (1)

(Continued on reverse side)

TRAINING AND EXPERIENCE OF EACH INDIVIDUAL NAMED IN ITEM 4 (Use supplemental sheets if necessary)

8. TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB (Circle answer)	FORMAL COURSE (Circle answer)
a. Principles and practices of radiation protection	See Attachment 2		Yes No	Yes No
b. Radioactivity measurement standardization and monitoring techniques and instruments			Yes No	Yes No
c. Mathematics and calculations basic to the use and measurement of radioactivity			Yes No	Yes No
d. Biological effects of radiation			Yes No	Yes No

9. EXPERIENCE WITH RADIATION. (Actual use of radioisotopes or equivalent experience.)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
		See Attachment 2		

10. RADIATION DETECTION INSTRUMENTS. (Use supplemental sheets if necessary.)

TYPE OF INSTRUMENTS (Include make and model number of each)	NUMBER AVAILABLE	RADIATION DETECTED	SENSITIVITY RANGE (mr/hr)	WINDOW THICKNESS (mg/cm²)	USE (Monitoring, surveying, measuring)
See Attachment 3					

11. METHOD, FREQUENCY, AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED ABOVE.

See Attachment 3

12. FILM BADGES, DOSIMETERS, AND BIO-ASSAY PROCEDURES USED. (For film badges, specify method of calibrating and processing, or name of supplier.)

Film badges provided and prosessed by Radiation Detection Inc. of Mountain View California.

INFORMATION TO BE SUBMITTED ON ADDITIONAL SHEETS

13. FACILITIES AND EQUIPMENT. Describe laboratory facilities and remote handling equipment, storage containers, shielding, fume hoods, etc. Explanatory sketch of facility is attached. (Circle answer) Yes No See Attachment 4

14. RADIATION PROTECTION PROGRAM. Describe the radiation protection program including control measures. If application covers sealed sources, submit leak testing procedures where applicable, name, training, and experience of person to perform leak tests, and arrangements for performing initial radiation survey, servicing, maintenance and repair of the source.

See Attachment 4

15. WASTE DISPOSAL. If a commercial waste disposal service is employed, specify name of company. Otherwise, submit detailed description of methods which will be used for disposing of radioactive wastes and estimates of the type and amount of activity involved. See Attachment 4

CERTIFICATE (This item must be completed by applicant)

16. THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATE ON BEHALF OF THE APPLICANT NAMED IN ITEM 1, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PART 30, AND THAT ALL INFORMATION CONTAINED HEREIN, INCLUDING ANY SUPPLEMENTS ATTACHED HERETO, IS TRUE AND CORRECT TO THE BEST OF OUR KNOWLEDGE AND BELIEF.

NRDL Disestablishment Group
Applicant named in item 1

Date 27 October 1969

By: (b) (6) [redacted] for

Head, NRDL Disestablishment Group
Title of certifying official

WARNING.—18 U. S. C., Section 1001; Act of June 25, 1948; 62 Stat. 749; makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

* U.S. GOVERNMENT PRINTING OFFICE : 1961 O—615583

ATTACHMENT 1

6a	6b	7
Byproduct Material with Atomic Numbers 3 to 82	Any Chemical or Physical form - 100 millicuries	Residual Contamination in NRDL Buildings
Byproduct Material with Atomic Numbers 1 to 82	Any Chemical or Physical form - 10 millicuries	Packaged Radioactive Waste pending Disposal
Hydrogen - 3	Any Chemical or Physical form - 10 millicuries	Residual Contamination in NRDL Buildings
Hydrogen - 3	Sodium Acetate on Al foil 1.0 microcuries	Equipment Calibration Standard
Pa - 234	0.01 microcurie Solid Pa	Equipment Calibration Standard
Am - 241	0.01 Microcuries Solid Am.	Equipment Calibration Standard

ATTACHMENT 2

TRAINING AND EXPERIENCE OF MR. (b) (6) [redacted]

August 1969 to present

Assistant Head, Health Physics Division for Disestablishment of NRDL

1959 - 1969

Head, Radiological Physics Branch, NRDL

1947 - 1959

Radiological Physicist, Nucleonics Division, NRDL

July 1946 - August 1947

Physicist, Industrial Laboratory, San Francisco Naval Shipyard

1961

Certified Health Physicist, American Board of Health Physics

1952

Certified Radiological Physicist, American Board of Radiology

ATTACHMENT 3

Type of Instruments	Number available	radiation detected	Sensitivity range	Window thickness	Use
lear Chicago Model 202 ver Supply and scaler n NRDL alpha scintillation ector	1	alpha	10^6 counts	n/a	counting
clear Chicago Model 186a ver supply and scaler with del t1 timer and P-10 gas counter with model 8734 -amplifyer.	1	beta-gamma	10^6 counts	n/a	counting
chnical Associates Hand foot monitor with beta-mma GM probe	1	beta-gamma	$2x10^2$-10^6 CPM	4.0 mg/cm^2	monitoring personnel
hnical Associates Model 4A lead shield with pex GN detector	1	beta-gamma	n/a	5.6 mg/cm^2	counting
erline AIM-3 air monitor	1	alpha	10^3-10^4 CPM	n/a	monitoring

ITEM II - Radiation Counting equipment will be calibrated using standards specified in Attachment 1, at time intervals determined by the Radiation Protection Officer, Mr. Eugene Tochilin.

Radiation Survey equipment will be calibrated by the U.S. Naval Radiac Repair Facility, San Francisco Bay Naval Shipyard, Hunter's Point, at intervals not to exceed six (6) months.

ATTACHMENT 3

Type of Instruments	Number available	radiation detected	Sensitivity range	Window thickness	Use
-113A/PDR portable beta-amma survey meter	4	beta-Gamma	$10^3 - 10^6$ CPM	4.0 mg/cm^2	surveying
M-154PDR 54 gas flow alpha urvey meter	2	alpha	$10^3 - 10^6$ CPM	n/a	surveying
berline Model E-112B beta-amma survey meter	3	beta-gamma	.2-20 mr/hr	4.0mg/cm^2	surveying
berline PAC-3G survey eter with TP1 tritium etector probe	1	beta	$10^3 - 10^5$ CPM	n/a	surveying
berline PAC-3G with DT-212 lpha survey probe	1	alpha	$10^3 - 10^6$ CPM	n/a	surveying
N/PDR-27 beta-gamma urvey meter	2	beta-gamma	.5-500 mr/hr	4.0 mg/cm^2	surveying
l-Tronics Model CP3DM igh range gamma survery eter	8	gamma.	$10^2 - 10^4$ mrad/hr	n/a	surveying
erkeley Model 2750-1 eta Gamma Survey meter	3	beta gamma	$5x10^2 - 5x10^4$ CPM	4.0 mg/cm^2	surveying

ATTACHMENT 4

ITEM 13 - The NRDL Health Physics Laboratory, located in Room 255, Building 815 will continue to serve as the Health Physics Laboratory.

ITEM 14 - All operations involving use of radioisotopes will be under the supervision of the Radiation Protection Officer, Mr. (b) (6) [redacted]

ITEM 15 - All Radioactive waste will be disposed of by transfer to a licensed Commerical Contractor.

12 Aug. 1969

(b) (6) [redacted] : 8-831-3900 Ext. 240 - Called this A.M.

1. Question — has the requested clearance limit for surface contamination from tritium been cleared with Bu Med? Ans. No! Al plans to discuss this with Cdr. Tedford to-day.

2. Question — has SRI recd. license authorizing Camp Parks Sources? Ans. Yes!

SRI Lic # 04-01043-11. There still are some legal angles to be worked out prior to xfer of bldgs. Similarly, xfer of the Cyclotron Bldg & facilities to Univ. California. Here again legal entanglements are holding up xfer.

3. Al will submit separate status ltr. to AEC via NAUELEX as soon as shipments & clean-up for each area has been completed.

9-12-69

Call [redacted] 119-7464

1. 3 Nov. 1969 dis-establishment dte.
Plan to have all pkges prepared to meet DOT & shipped prior to this dte.
Left. - 04-00487-03

2. Decontamination may be necessary after this dte.

3. Property reverts back to Shipyd this dte.

4. Will be a nucleus from Lab still there
(Called disclosure group)

[redacted]

What is the situation
What is the status of nitrogen on license
Don't know what to send - facts.

5. Should a ltr be prepared explaining above what will be needed to properly inform AEC. - Will be an Organizational and Personnel chge.

What is not there -
May not be able to handle in 1 $

9900
Ser 160 - 0516
7 August 1969

FIRST ENDORSEMENT OF NRDL LETTER 730-553 ALS:jhj OF 28 JULY 1969

From: Commander, Naval Electronic Systems Command
To: Chief, Isotopes Branch
Division of Materials Licensing
U. S. Atomic Energy Commission
Washington, D. C. 20545

Subj: Final Clearance Limits (b) (6)

Ref: (a) FONECON between (b) (6), RAVELEX and (b) (6) NRDL on 7 August 1969

1. Basic letter contains a request from the Laboratory for modification of subject limits relevant to surface tritium contamination.

2. This contamination has resulted from the handling and use of tritium targets. The targets were used in the operation of particle accelerators and the contamination is confined to two buildings as discussed during the telephone conversation, reference (a).

3. The dis-establishment of the Laboratory is scheduled for 3 November 1969. The decontamination is a part of the effort of clearing areas where radioactive material authorized under AEC Licenses were handled.

(b) (6)
By direction

Copy to:
BUMED(Code 74)
NRDL, SFRAN

(b) (6)

61457 - 8/7/69

U. S. NAVAL RADIOLOGICAL DEFENSE LABORATORY
SAN FRANCISCO, CALIFORNIA 94135

IN REPLY REFER TO:

730-553
AIS;jhj

28 JUL 1969

Ltr rec'd: 8/7/69 & fwd. by 1st. end. to AEC by Ser 0516 — 8 Aug. 1969. Hand carried to AEC on 4 August 1969.

From: Commanding Officer
To: Chief, Isotope Branch, Division of Materials Licensing, U.S. Atomic Energy Commission, Washington, D.C. 20545

Via: Commander, Naval Electronic Systems Command (Code 05163), Munitions Bldg., Room 4713, Nucleonics Branch, 18th and Constitution Aves., Washington, D.C. 20390

Subj: Final Clearance Limits; request for modification of

1. This Laboratory is in the process of clearing work spaces of licensed materials held under its several AEC licenses. In two of these spaces we have surface tritium contamination resulting from the handling and use of targets used in the operation of particle accelerators.

2. In as much as surface adsorbed tritium is difficult to remove and does pose a personnel hazard several orders of magnitude below that of most radionuclides, some relief is requested from the existing removable contamination limit of 1000 dpm/100 cm^2 for beta emitters. We wish to propose a release limit of 10,000 dpm/100 cm^2, such limit to be contingent upon the application of at least two wet cleaning efforts before release.

3. We feel that this limit will not pose any significant hazard to personnel occupying the space after release.

(b) (6)

By direction

5 Aug. 1969

Telcon From NRDL

1. (b) (6) [redacted] wondered about Te sources (25) Units

2. (b) (6) [redacted] stated dis-establishment date for the Laboratory is 3 November 1969. In approximately (1) month they will know what millicurie level exists in the Lab. spaces which are being de-contaminated. Question as to License after the 3 Nov. date. Work & personnel will be under San Fran. Bay Naval Shipyard - Hunters Point Division. Believe mostly Byproduct. May be some SNM.

Question - as to who should be licensed? Organization, Personnel & Quantities

8/6/69 (b) (6) [redacted] Returned Call & Gave Him The Info. From (b) (6) [redacted]

3. Called (b) (6) [redacted] said he gave the Lab an extension of (1) year. Have Lab come in with a status report - just a ltr. - stating what progress has been made, etc.

a) Request termination of License after making Xfer of all material. Guess could be made at time of Xfer.

DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
WASHINGTON, D.C. 20350

IN REPLY REFER TO
OP-753/1s
Ser 90P75
20 JUL 1969

From: Chief of Naval Operations
To: Distribution List

Rec'd. 9/2/69

Subj: Naval Radiological Control (NAVRADCON) Team Responsibilities; transfer of

Ref: (a) NRDL SFRAN ltr 160-25 of 27 Jun 69 (NOTAL)
(b) CHNAVMAT 1st End ser 280 of 5 Jul 69 (NOTAL)
(c) OPNAVINST 8110.16C

1. As requested by reference (a) and endorsed by reference (b), the Naval Radiological Defense Laboratory (NRDL), San Francisco, California, is relieved of NAVRADCON TEAM responsibilities assigned by reference (c) effective 1 August 1969.

2. In consonance with reference (b), the Chief of Naval Material is requested to establish a composite Naval Radiological Control team at the U.S. Naval Ordnance Laboratory, White Oak, Maryland, composed of:

a. Radiation monitoring and decontamination experts from NOL.

b. Ordnance disposal personnel from EODFAC, Indian Head, Md.

c. Medical personnel (source to be designated by BUMED).

RADCON responsibilities should be assumed at NOL at the earliest practical date, however, not later than 1 November 1969. CNM is authorized to disestablish the EODFAC RADCON team upon activation of the NOL team.

3. It is desired that the NAVRADCON team, including support personnel and equipment, be capable of rapid world-wide deployment when requested in response to radiological accidents involving nuclear weapons. It is further desired that the transfer of RADCON responsibilities be accomplished in a manner which will retain the maximum Navy response capability during the transition period.

4. Since the Navy does not possess the capability to meet world-wide transportation requirements, this headquarters will make necessary arrangements with the Military Airlift Command for emergency airlift support. CNM should, as a matter of routine, establish a contingency fund for reimbursement of transportation costs incurred by deployment of the NAVRADCON team.

(Continued)

0516

OP-753/ls
Ser 90P75

5. The Chief, Bureau of Medicine and Surgery is requested to provide medical support personnel as required by CNM.

6. The attention of all commands involved in the implementation of the above changes is invited to the reporting requirements of paragraph 8.b.(2) of reference (c).

7. Direct liaison between all concerned is encouraged and authorized. Reference (c) will be revised to reflect changes as requested above.

(b) (6)

By direction

Distribution List:
CHNAVMAT
CHBUMED
NRDL

Copy to:
CINCPACFLT
CINCLANTFLT
CINCUSNAVEUR
CHNAVMAT (MAT 031N)
DNL
NAVORDSYSCOM (082)
NAVELECSYSCOM (0516)
NAVSHIPSYSCOM (03541)
BUMED (723)
COMNAVDIST WASH DC
COMTWELVE (35B)
COMNAVSHIPYD SFRAN (H101)
NOL WO
NAVEODFAC
NAD McALESTER
JNACC
DIR DASA
FC DASA

July 14, 1969

Call from (b) (6) [redacted], NAVFAC concerning licensing of byproduct material at NURDC (Naval Underwater Research and Development Center) shortened now to NUC. They are now dealing with personnel there (NAVFAC) concerned with isotope power supplies and was concerned whether it would be allright for NAVFAC to also advise them and help them on transfer of some sources from NRDL.

Could find no record of any previous correspondence from NUC or NURDC so agreed that NAVFAC advise and assist them in licensing with possibility we assume licensing function at some future date if they should be inc

7-10-69

NRDL's Listing of Items

[AEC 8-38-12 License Includes]

TS-1189 - (k) - no single source to contain more than 700 μCi. of ^{137}Cs - Victoreen S. Model 772
Pge-1

AN/SDR-2 - (l) - no single source to exceed 500 μCi. of ^{85}Kr Nuclear Corp. of Am.
Pge-5

AN/PDR-43 - (f) - U.S. Radium Source Model LAB-612 - no single source to exceed 100 μCi. of ^{85}Kr
Pge-5

DT-174/BDQ-1 - (a) - U.S. Radium source Model LAB-277 - no single source to exceed 100 μCi. of ^{90}Sr
Pge

AN/PDR-45 - (h) - Nuclear Chicago Model RG-31 - no single source to exceed 40 μCi. of ^{90}Sr

AN/PDR-52(XN-2) & AN/PDR-43(XN-2) - Not On 8-38-12 Lic

7-10-69

Telcon to NAVSEEACT 9ND

(b) (6) [redacted] Rad Safe Officer

1. Reviewed INST. 5100.2, dtd. 11 June 1969
Two changes are recommended:
a) #3 SCOPE — line 3 - - Sr (eg. the AN/PDR-18( ) radiac sets) - - -
b) #5 ACTION — sub paragraph b. add after last sentence. Copies of regs. will be posted in the Radiac Repair Facility.

7-10-69

Telcon To (b) (6) [redacted] Office @ NOL.

1. Preparing mtl. for ltr to AEC requesting authorize for possession for storage only of licensed mtls to be X ferred to NOL.
2. Have discussed what is to be done with (b) (6) [redacted], AEC.
3. Plan is to visit NAVELEX on 11 July 1969 & review mtl. in ltr prior to submission to AEC.
4. Will be in to see (b) (6) [redacted] & then here on Friday morning.

7-8-69

Telcon From L Cdr. [redacted] (b) (6) Ext 260

8-727-3870

Hd. Ocean Science Dept.
Naval Under Seas Res. & Dev. Center
San Diego, California

{619 / 262}

1. Plan to have radioactive mtl. Xferred from NRDL which can be used in program

2. Talked to [redacted] (b) (6) - who suggested L Cdr. [redacted] (b) (6) contact AEC & NAVELEX

3. During telcon with [redacted] (b) (6), AEC, Nate suggested send the ltr to AEC via 05163 - said it would be cleared then & handled properly.

4. Suggested put in ltr following
a) Who will be responsible - Rad. Prot. Officer
b) Where packages of mtl. stored?
c) Statement - "not to be removed from packages & shipping container until a Possession & Use Lic. is issued.
d) Include - Model #s, isotopes, activity & quantity, etc.

Fine - Safety Officer

Telcon With [redacted] 7-8-69

1. Al stated he had talked with Lab. [redacted]
a) Will package all items - sources, solutions, etc. at Lab to meet DOT regs.

2. Have been working at Camp Parks.
a) Stanford Res Inst - Medicine for Hot Cell use & possession.
b) SRI - will take over the range & pick up heavy sources. Working on their License now.

3. Working in Van de Graff bldg - found some Tritium contamination.
Levels of acceptance: AEC & Ba Med
1000 dpm / 100 cm^2
0.2 mrad/hr @ 1 cm.

4. Have reviewed their prob with Ba Med. [redacted] probably will remain until closed-out.

5. Have & are considering outside help - if necessary for clean-up. Funds-checking.

7-7-69

Next Call To [redacted] (b) (6).

1) Check with [redacted] as to [redacted] (b) (6) staying on out at the Lab until everything is cleaned up.

2) Believe Cdr. [redacted] (b) (6) would like [redacted] (b) (6) back here as soon as possible; however, after some discussion he may decide that since BuMed has had some of their programs at the Lab. & radioactive materials were involved that [redacted] (b) (6) would be the man to have present until the job was completed.

3. Any experience with closing out activities - Will AEC issue termination of license without being satisfied that all spaces are clean?

4. Has any thought been given to having an outside contractor come in to do any decontamination

5. Has CNM indicated any funds to be used for cleanup?

ROUTE SLIP AND OFFICE MEMO
NAVELEX-5216/1A (1-67)

DO NOT DETACH FROM OFFICIAL CORRESPONDENCE.
WRITE OR PRINT LEGIBLY IN INK.

CONTROL NO.	REPLY DUE BY

ORIGINATOR (Code, and Extension when applicable)	SERIAL	DATE	SUBJECT CLASS.	CROSS REF.
0516		7-7-69		

ROUTE TO CODE	SYMBOL	RELEASED INITIAL	DATE MON.	DAY	YEAR	SUBJECT / ENCLOSURE
						SUBJECT: NSY San Fran msg 021526Z July to NRDL
						SIGNATURE, EXT. CODE AND DATE ARE TO FOLLOW COMMENTS. SYMBOLS: A - Action, C - Comment, I - Information, P - Prepare Reply, R - Retain Copy
051						This msg, received in 0516 7/7/69, has been discussed with NRDL (Cdr [redacted], Code 120, and Mr. [redacted], Code 730). They were advised that we do not agree with NAVELEX becoming licensee for "residual" sources (see ¶ 2.B). They agree with us that NSY San Fran should take this responsibility; and feel that they can convince the shipyard to do so, by "volunteering" assistance of the knowledgeable NRDL people. They will pursue that tack with the shipyard. [redacted]

FILE — UNLESS THIS MATERIAL IS TO BE FURTHER ROUTED RETURN TO FILE BY DATING AND INITIALING.

INITIAL | DATE

GPO-931-914

3 (b) (6) [redacted]

56932

RTTUZYUW RUWMHOA0058 1831525-UUUU--RUEBBHB RUEBBHA.
ZNR UUUUU
R 021526Z JUL 69
FM SFRAN BAY NAVSHIPYD VALLEJO
TO RUWMHRA/NAVRADDEFLAB
INFO RUEBBHB/CHNAVMAT
RUEBBHA/COMNAVSHIP
RUEBBHA/COMNAVELEX
ZEN/NAVELEXWESTDIV
RUEBHIA/NAVFACENGCOM
BT
UNCLAS
NAVMAT PASS TO CODE 033
NRDL RESIDUAL FUNCTIONS
A. UR LTR 101-24 WEC:RPG OF 26 JUN 69
B. FONECON NRDL(SMITH) AND SFBNS(ROSATI)
C. NAVMAT MSG 232014Z OF 23 MAY 69
1. NRDL LICENSE ENCL WITH REF A AND DISCUSSION OF SUBJ RESIDUAL FUNCTION IN REF B HAVE BEEN STUDIED BY COGNIZANT STAFF CONSULTANTS. REVIEW OF CAPABILITIES IAW REF C ESTABLISHED THAT SFBNS DOES NOT NOW POSSESS ADEQUATE RESOURCES. SFBNS LACKS SUFFICIENT PERSONNEL, EXPERIENCE, FACILITIES, AND EQUIPMENT TO UNDERTAKE EFFECTIVELY THE RESPONSIBILITIES INVOLVED IN DISPOSITION OF QUANTITIES OF

ROUTING CODE	91414
ACTION ELEX	
INFO ELEX	012
INFO ELEX	0516
INFO ELEX	03
INFO ELEX	

PAGE TWO RUWMHOA0058 UNCLAS
RADIOACTIVITY PERMITTED UNDER NRDL LICENSE AS WELL AS DECONTAMINATION TO FINAL CLEARANCE LEVELS OF NRDL SPACES. SCOPE AND COMPLEXITY OF THIS RESIDUAL FUNCTION IS VERY EXTENSIVE AND REQUIRES AN ORDER OF TECH SURVEILLANCE WHICH IS DIFFICULT TO OBTAIN.
2. SUGGEST FOL ALTERNATIVE BE CONSIDERED TOWARD EFFECTIVE ACCOMPLISHMENT OF SUBJ FUNCTION.
A. DELAY DEPARTURE OF KNOWLEDGEABLE TECH PERSONNEL PRESENTLY DEALING WITH PROBLEM UNTIL FUNCTION IS COMPLETE. AS REQUIRED, TEMP TRANSFER PERSONNEL TO NAVELEX WESDIV.
B. TRANSFER AEC LICENSE TO NAVELEX ON CUSTODIAL BASIS FOR STORAGE AND DISPOSITION OF SOURCES TO AUTHORIZED RECIPIENTS.
C. EXPLORE AVAILABILITY OF ADDITIONAL TECH SUPPORT FROM NAVFAC.
D. MEET WITH COGNIZANT SFBNS PERSONNEL TO DETN DETAILS OF AVAL SUPPORT RESOURCES ASAP.
BT
#0058

ROUTING CODE	91414
ACTION ELEX	
INFO ELEX	
INFO ELEX	
INFO ELEX	
INFO ELEX	

MAIN NAVY DELIVERY DESK
RECEIVED
1969 JUL 3 AM 6 53

7-7-69

Telcon With (b) (6) [redacted], NRDL - 8-831-3900, Ext. 240

1. Called re- msge from SFRANBAY NSHIPYD to LAB which stated the shipyd couldn't carry on residual functions due to lack of personnel, experienced people, etc. [DLSC - Defense Logistic Support Center (Surplus Property List)]

2. Al stated that this enquiry by NRDL with Shipyd people was held because of the apparent rapid chging in closing dates. Initially 12/3/69 - then chged to 11/15/69 - & again to 11/3/69. Had been some discussion of chge to 10/3/69; however, this has again been reversed & now the dte stands at 11/3/69.

3. (b) (6) [redacted] & (2) others presently plan to stay on until the disposition of material & all decontamination of buildings associated with Lab. have been completed.

4. Mentioned that 0516, Messrs. (b) (6) [redacted] had recently talked to Cdr. (b) (6) [redacted], in Smith's absence, & all sealed sources not being xferred would be properly packed to meet DOT regulations. These sources would be shipped to those having a need for mtl. after supplying their AEC Lic. # to the Laboratory.

5. Some areas are being decontaminated - how extensive & the dollar value of sources not being xferred unknown at this time.

CODE 0516 ROUTE SLIP NAVELEX 5216/14 (5-68)

INDICATE ACTION BY USING APPROPRIATE NUMBER

1. APPROVAL
2. COMMENT
3. FILE
4. INFORMATION
5. INITIAL AND FORWARD
6. PREPARE REPLY
7. SEE ME IN REGARD TO THIS
8. SIGNATURE

ROUTE TO	NAME	ACTION	INITIAL	DATE
✓	0516 [redacted] (b) (6)		✓	7/10
	0516X			
✓	05161			
✓	05162		[redacted] (b) (6)	7-14
	0516S			
✓	05163 [redacted] (b) (6)			7/0
✓				7/10
	NRDL			
	NOL			
	DESTROY			

REMARKS

Suggest finding out why [redacted] (b) (6) doesn't want the radiac sources (red checks - there may be others I missed.)

[redacted] (b) (6)

Forecon
7-11-69

Checked with NRDL (942) - Told them to follow through by going to Edwards and getting this squared away

(over)

[redacted] (b) (6)

Recommend the DT174/BDS-1 course be disposed of rather than transferring to another activity unless they want to take it with them to NCL. (b) (6) [redacted] 7/15

U. S. NAVAL RADIOLOGICAL DEFENSE LABORATORY
SAN FRANCISCO, CALIFORNIA 94135

IN REPLY REFER TO:
250
CJS:itr
7 July 1969

From: Commanding Officer
To: Commander, Naval Supply Center (Code 401)
Oakland, California 94625

Subj: Accelerated Screening of Radioisotopes; request for

Ref: (a) Telecon of 3 Jul 69 between Lt. [redacted] (b) (6) Director Disposal Div., NSC Oak & Mr. [redacted] (b) (6), NRDL

Encl: (1) Radioisotope Listing (3 copies)

1. Prior to closure of NRDL it is essential to dispose of all radioactive sources in custody at this activity. Changes in closure dates precludes following normal procedures in advertising surplus property. Therefore, it is requested that enclosure (1) be published and distributed as a "Flier". The period of time allowed for screening should be held to a reasonable minimum.

2. Attention should be directed in the flier that an AEC or State by product or special nuclear material license is required for the possession of the listed material. Evidence that the receiving activity holds such a license will be required before transfer can be made.

3. For information concerning the radioisotopes listed in enclosure (1) the following NRDL personnel should be contacted:

Mr. [redacted] (b) (6) or
Mr.

Phone: Area Code (415) 648-6900
Ext. 240, 243 or 244

[redacted] (b) (6)
CDR, USN
By direction.

Copy to:
NAVELEX 0516

Radioisotope	Quantity (Approx.) as of 1 Jul 69	Description (Sealed Sources)
Americium-241	2.21 Curies	Monsanto Research Corp. Model MRC-G-SS-W-AM-048. 304-ss double encapsulation. 1" OD. 0.0033" window. No. 3
Americium-241	10 millicuries	Collimated stainless steel encapsulation. No. 5
Americium-241	2 millicuries	Isotope Products Laboratories. No. 1104A. Diffusion bonded source. No. 7
Americium-241	30 millicuries	Ring-shaped 1/16" o.d. aluminum tube, 1 15/16" dia. No. 8
Barium-133	8 microcuries	Isotope Products Laboratories. No. 191 A. Calibration Disc. No. 1
Carbon-14	1.5 microcuries	U.S. Naval Applied Science Laboratory. Beta Response Unit, BS-1/5979. Set No. 1 No. 1
Carbon-14	1.5 microcuries	U.S. Naval Applied Science Laboratory, Beta Response Unit, BS-1/5979. Set No. 5 No. 2
Cadium-109	1 millicurie	Isotope Products Laboratories. No. 197. Diffusion bonded source. No. 4
Cesium-137	90 curies	Beamed shielded container with lever operated port opening. No. 2
Cesium-137	100 curies	Vertical or horizontal beamed shielded container. No. 7
Cesium-137	25 curies	Beamed shielded container. No. 9
Cesium-137	400 millicuries	Radiochemical Centre Source No. A531. Catalog No. CDCM-500. Diameter of active pellet, 3.0 mm. Source threaded into end of plug. No. 10

ENCLOSURE (1)

Radioisotope	Quantity (Approx.) as of 1 Jul 69	Description (Sealed Sources)
Cesium-137	100 curies	Beamed shielded container. No. 11
Cesium-137	700 microcuries	Victoreen Instrument Co., Model 772, Ser. No. 000. TS-1189/PD Dosimeter Test Chamber Prototype. No. 14
Cesium-137	600 microcuries	Victoreen Instrument Co. Serial No. 16. TS-1189/PD. Dosimeter Test Chamber. No. 15
Cesium-137	45 curies, 950 millicuries and 45 microcuries	U.S. Nuclear Corp., Nos. M-229, J-505 and M-202. Three sources mounted in beamed shielded container. Any one source can be positioned in collimated beam opening. No. 18, 19, & 20.
Cesium-137	30 curies	Naval Research Lab., Wash., D.C. TS-121 6C/UD Calibrator, Radiac. Ser. No. B4. Source Ser. No. 83-92. No. 34
Cesium-137	6 curies	Beamed shielded container. No. 1
Cesium-137	1 curie	Encapsulated source in storage container. No. 12
Cesium-137	300 millicuries	U.S. Nuclear Corp. No. L-323. Capsule Model 375. Storage container. No. 13
Cesium-137	100 curies	AN/UDM-1A, Radiac Calibrator Set. Set #C-1. No. 16
Cesium-137	100 curies	AN/UDM-1A, Radiac Calibrator Set No. 17. Ser. No. 91. No. 17
Cesium-137	800 microcuries	AN/USM-195 (XN-1) Test Set, Radiac Tube. U.S. Naval Applied Science Lab., Ser. No. 1. No. 32
Cesium-137	1 millicurie	AN/USM-113. Test Set, Radiac Tube. Electronics Product Co., Mt. Vernon, N.Y. Ser. No. A-10. No. 33

Radioisotope	Quantity (Approx.) as of 1 Jul 69	Description (Sealed Sources)
Cobalt-60	1 curie	AN/UDM-1 Type container. BUSHIPS No. 40. No. 3
Cobalt-60	1 curie	Beamed shielded container. No. 108
Cobalt-60	50 curies	Beamed shielded container. No. 109
Cobalt-60	400 microcuries	Source attached to end of plug which fits into shielded container. No. 115
Cobalt-60	400 microcuries	Source attached to end of plug which fits into shielded container. No. 116
Cobalt-60	1000 curies	Source in track mounted shielded container which can be placed over either one of two shielded wells and lowered for use. No. 127
Cobalt-60	5 curies	U.S. Nuclear Corp. Source No. L-524. Source stored in spherical shielded container from which it can be raised and rotated. No. 128
Cobalt-60	30 curies	Radiac Calibrator Set. ID #131-142858. Mfg. Nems-Clarke, Inc. No. 129
Cobalt-60	300 microcuries	Encapsulated source in shielded container. BUSHIPS Serial No. 9. No. 143
Cobalt-60	300 microcuries	Encapsulated source in shielded container. BUSHIPS Serial No. 11. No. 144
Cobalt-60	150 microcuries	Encapsulated source in shielded container. BUSHIPS Unit No. 10. No. 148
Cobalt-60	1 curie	Encapsulated source in storage container. No. 2
Cobalt-60	100 millicuries	Encapsulated source in storage container. No. 8

Radioisotope	Quantity (Approx.) as of 1 Jul 69	Description (Sealed Sources)
Cobalt-60	40 millicuries	Encapsulated source in storage container. No. 9
Cobalt-60	30 millicuries	Encapsulated source in shielded container. No. 10
Cobalt-60	6 curies	Encapsulated source in shielded container. No. 101
Cobalt-60	30 curies	Encapsulated source in shielded container No. 110
Cobalt-60	700 millicuries	Encapsulated source in storage container No. 111
Cobalt-60	100 millicuries	Source attached to tip of plug which fits into shielded container. No. 114
Cobalt-60	200 Millicuries	Encapsulated source in storage container. No. 117
Cobalt-60	10 millicuries	Source threaded in bottom of plug which sets into shielded container. No. 118
Cobalt-60	100 millicuries	Encapsulated source in shielded storage container. No. 119
Cobalt-60	1 curie	Beamed shielded container. No. 121
Cobalt-60	300 microcuries	Encapsulated source in shielded container. BUSHIPS Unit #12. No. 146
Cobalt-60	10 cicrocuries	Ser. No. 14. Encapsulated source in storage container. No. 147
Cobalt-60	1000 curies	Source mounted on plug which can be pneumatically lifted from shielded container for exposure. Cask #1. No. 123

Radioisotope	Quantity (Approx.) as of 1 Jul 69	Description (Sealed Sources)
Cobalt-60	1000 curies	Source mounted on plug which can be pneumatically lifted from shielded container for exposure. Cask #2. No. 124
Cobalt-60	1000 curies	Source mounted on plug which can be pneumatically lifted from shielded container for exposure. Cask #3. No. 125
Cobalt-60	1000 curies	Source mounted on plug which can be pneumatically lifted from shielded container for exposure. Cask #4. No. 126
Krypton-85	1 millicurie	AN/SDR-2. Radiac Set. Serial No. 41. Nuclear Corporation of America. No. 2
Krypton-85	50 microcuries	AN/PDR-43, Radiacmeter. Ser. No. 922. Electronic Products Co. MX-2608/PDR-43 Krypton-84 source sealed in thin wall tubing permanently soldered in recess of function selector. No. 3
Promethium-147	25 millicuries	3M Model 3L2A. Ser. No. 1002. Microspheres sealed in disc with aluminum window. No. 1
Plutonium-239	2.964 grams	Plutonium-Beryllium neutron source. Source in parrafin filled storage container. Special Nuclear Material License required. No. 1
Plutonium-239	79.93 grams	Plutonium-Beryllium neutron source. Monsanto Research Corp. M-232. Source in 15 gal. parrafin filled drum. B.E. Permit 1113. Special Nuclear Material License required. No. 2
Plutonium-239	79.16 grams	Plutonium-Beryllium neutron source. Monsanto Research Corp. M-428. Source in 15 gal. parrafin filled drum. B.E. Permit 1113. Special Nuclear Material License required. No. 3

Radioisotope	Quantity (Approx.) as of 1 Jul 69	Description (Sealed Sources)
Plutonium-239	16 grams	Plutonium-Beryllium neutron source. Nuclear Materials & Equipment Corp. Serial No: 160A50. Source in 15 gal. parrafin filled drum. B.E. Permit 1113. Special Nuclear Material License required. No. 6
Plutonium-239	16 grams	Plutonium-Beryllium neutron source. Nuclear Materials & Equipment Corp. Ser. No. 160A113. DOT 7A drum. Special Nuclear Material License required. No. 22
Plutonium-239	160 grams	Plutonium-Beryllium neutron source. Nuclear Materials & Equipment Corp. Serial No: 1600K28. B.E. Permit 1113 drum. Special Nuclear material License required. No. 23
Plutonium-239	760 grams	Plutonium-Fluoride neutron source. Hanford Atomic Products Operation. Source stored in parafin drum. Special Nuclear Material License required. No. 4
Radium	105 micrograms	Radium Chemical Co. I.D. RWS #8807. Silver cylinder 3.55 mm long, 3.55 external dia. No. 7
Radium	206 micrograms	Metal cylinder marked: PRESS 5-109-C Groove C. No. 8
Plutonium-239	80 grams	Plutonium-Beryllium neutron source. Nuclear Materials & Equipment Corp. Ser. No. NUMEC 800-H-14. B.E. Permit 1113 drum. No. 5
Radium	25 milligrams	Encapsulated source in shielded cask. BUSHIPS No. 40. No. 13
Radium	1 Milligram	Radium Chemical Co., Inc. No. 19772. Platinum-iridium needle. Total length 27.7 mm. Active length 15mm. External diameter 1.65 mm. Wall thickness 0.5 mm. No. 14.

Radioisotope	Quantity (Approx.) as of 1 Jul 69	Description (Sealed Sources)
Radium	500 micrograms	BS-2/5980. Gamma Response Unit. #1. NASL. No. 17
Radium	500 milligrams	BUSHIPS Unit #23. Source wedged in container.
Radium	459.1 milligrams	Encapsulated source in shielded storage container. Unit 18-19. No. 2
Radium	48.7 milligrams	Encapsulated source in shielded container. BUSHIPS Unit 39. No. 4
Radium	9.74 milligrams	Radium Chemical Co. RWS #8809. In shielded storage container. No. 5
Radium	117 micrograms	Metal cylinder marked NiCD 12 BWG BB. No. 10
Radium	100 micrograms	Metal cylinder sealed in glass. Marked NiCD 12 BWG BB. No. 11
Radium	1 milligram	Victoreen R Chamber check source. Model 540. Serial 111. No. 12
Radium	100 micrograms	AN/USM-23. Test Set, Electron Tube. Electronic Products Co. Serial No. 61. Source encapsulated in a 0.5 mm platinum container. No. 19
Radium	100 micrograms	AN/PDR-27 ( ) Modified. Radiac Tube Tester for 5979 and 5980 tubes. No. 20
Radium	50 micrograms	5979/BS-1 Excitation Unit (for tube type 5979). Lionel Corp. No. 22
Radium	500 micrograms	5980/BS-2 Excitation Unit (for tube type 5980). Lionel Corp. No. 23
Radium	50 micrograms	BS-1/5979, Gamma Response Unit. #4. No. 15
Radium	50 micrograms	BS-1/5979, High Sensitivity G-M Tube Excitation Unit, Model No. 1. #3. No. 16

Radioisotope	Quantity (Approx.) as of 1 Jul 60	Description (Sealed Sources)
Radium	500 micrograms	BS-2/5980, Gamma Response Unit. #4. No. 18
Radium	1.71 milligrams	Radium Chemical Co., Inc. No. 13361. Radium-Beryllium neutron source. No. 5
Radium	100.51 milligrams	Radium-Beryllium neutron source. Radium Chemical Co., Inc., #RWS 10517. No. 1
Radium	25 milligrams	Radium-Beryllium neutron source. U.S. Radium Co. #83835. No. 2
Radium	10.08 milligrams	Radium-Beryllium neutron source. I.D. No. 13363. No. 3
Radium	1.74 milligrams	Radium-Beryllium neutron source. Radium Chemical Co., Inc. Cylinder #13360. No. 4
Strontium-90	20 millicuries (total)	Automatic Film Calibrator. Material mixed in dental plaster. (Seven sources). Not encapsulated. No. 26-32.
Strontium-90	17 millicuries	Medical Applicator. Tracerlab RA-1 Ser. No. 33. No. 42
Strontium-90	1.5 curies	Dental plaster disc in shielded container. No. 45
Strontium-90	40 millicuries	Sealed brass cup, approx. 1 cm in dia. and $\frac{1}{4}$ in. deep in plastic holder. No. 46
Strontium-90	18 millicuries	Nuclear-Chicago. Model No. 187231. Ser. No. T-50. Located in collimated lid of lead storage container. No. 50
Strontium-90	95 millicuries	3M Model 3A1Z. Ser: 1016. Microspheres. No. 52

Radioisotope	Quantity (Approx.) as of 1 Jul 1969	Description (Sealed Sources)
Strontium-90	20 millicuries	TS-784A/PD Calibrator, Radiac. Ser. No. 304 (U.S. Army) No. 53
Strontium-90	30 microcuries	DT-174/BDQ-1, Detector, Radiac (Gamma) Ser. No. 6, component of CP-304/BDQ-1, Computer-Indicator Radiac (Gamma) Ser. No. 6. No. 73
Strontium-90	75 millicuries	Film Exposure Unit. Material in plastic cup. No. 48
Strontium-90	300 microcuries	AN/PDR-52(XN-2) Radiac Set, Ser. No. 21. Maico Electronics, Inc. No. 54
Strontium-90	300 microcuries	AN/PDR-52(XN-2) Radiac Set., Ser. No. 13. Maico Electronics, Inc. No. 55
Strontium-90	300 microcuries	AN/PDR-52(XN-2) Radiac Set., Ser. No. 8. Maico Electronics, Inc. No. 56
Strontium-90	300 microcuries	AN/PDR-52(XN-2) Radiac Set, Serl No. 24. Maico Electronics, Inc. No. 57
Strontium-90	20 microcuries	AN/PDR-43(XN-2), Radiac Set. Ser. No. 47. Electronic Products Co. No. 59
Strontium-90	20 microcuries	AN/PDR-43(XN-2), Radiac Set. Ser. No. 40. Electronic Products Co. No. 60
Strontium-90	20 microcuries	AN/PDR-43(XN-2), Radiac Set. Ser. No. 31 Electronic Products Co. No. 61
Strontium-90	20 microcuries	AN/PDR-43(XN-2), Radiac Set. Ser. No. 31(?) Electronic Products Co. No. 62

Radioisotope	Quantity (Approx.) as of 1 Jul 1969	Description (Sealed Sources)
Strontium-90	20 microcuries	AN/PDR-43(XN-2), Radiac Set. Ser. No. 46. Electronic Products Co. No. 63
Strontium-90	20 microcuries	AN/PDR-43(XN-2), Radiac Set. Ser. No. 16. Electronic Products Co. No. 64
Strontium-90	20 microcuries	AN/PDR-43(XN-2), Radiac Set. Ser. No. 23. Electronic Products Co. No. 65.
Strontium-90	20 microcuries	AN/PDR-43(XN-2), Radiac Set. Ser. No. 10. Electronic Products Co. No. 66
Strontium-90	20 microcuries	AN/PDR-43(XN-2), Radiac Set. Ser. No. 25. Electronic Products Co. No. 67
Strontium-90	20 microcuries	AN/PDR-43(XN-2) Radiac Set. Ser. No. 34. Electronic Products Co. No. 71
Strontium-90	30 microcuries	AN/PDR-45, Radiac Set. Ser. No. 10. Electronic Products Co. No. 72
Strontium-90	20 microcuries	AN/PDR-43(XN-2), Radiac Set. Ser. No. 32. Electronic Products Co. No. 69
Technetium-99	183 microcuries (total)	NASL Beta Calibration Set. No. 1. Five Saran covered sources. No. 1-5
Technetium-99	183 microcuries (total)	NASL Beta Calibration Set No. 2. Five Saran covered sources. No. 6-10
Thallium-204	15 millicuries	3M Model 3L9Z. Ser. No. 1001. Microspheres No. 1
[illegible]	[illegible]	Universal Beta Response Unit. Saran covered sources in metal case. NASL. Carbon-14 120 microcuries Chlorine-36 6 microcuries Strontium-90 6 microcuries No. 3,1,51

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

JUN 18 1969

DML:IB:NB
(04-00487-03)

Commanding Officer
U. S. Naval Radiological
Defense Laboratory
San Francisco, California 94135

Dear Sir:

Enclosed is Amendment No. 30 to License No. 04-00487-03 which extends the expiration date of the license to March 31, 1970.

We will reply shortly to your inquiry about AEC requirements for retention of records resulting from operations under AEC licenses.

Sincerely,

(b) (6) [redacted]

Assistant Chief
Isotopes Branch
Division of Materials
Licensing

Enclosure:
Amendment No. 30
to Lic. No. 04-00487-03

5/27/69

Telcon From NRDL

1. a) (b) (6) [redacted] —
a list has been prepared & includes all radioactive material (i.e. sealed sources; unsealed sources; counting standards; & stable compounds.) May items will normally fall into waste disposal category; others may go onto a surplus list to be circularized. with cpy to NAVILEX
b) List with suggestions on Programs will be sent to CNM.

2. It now appears that the Nuclear Warfare Effects Program which includes some of: Physics, Chemistry Dosimetry, & bulk (i.e. Radiac Development & Evaluation). Dale Williams will no doubt want to xfer some of the things to NOL.

3. Some eqpts will probably be up for bid (i.e. 1000 channel analyzer with total Body Counter. (b) (6) [redacted] from Mare Island has inquired about this item.

9900
Ser 103 - 0516

From: Commander, Naval Electronic Systems Command
To: Commanding Officer
Naval Radiological Defense Laboratory
San Francisco, California 94135

MAY 19 1969

Subj: Cesium-137 Sealed Source In AN/UDM-1A Radiac Calibrator

Ref: (a) FONECON between LT. (b) (6), USMC and (b) (6), NRDL and G. Mahaffey, NAVELEX on 14 May 1969
(b) (6)

Encl: (1) Marked AEC-313 Form with Supplemental Material

1. Enclosure (1) is forwarded for information and retention and covers the material reviewed during the telephone conversation, reference (a).

2. The information is intended for guidance only; however, it should facilitate the preparation of a Marine Corps application for an AEC Byproduct Material License for the subject source. Areas covered in this supplemental material are relevant to items listed in the AEC-313 Form and include; training and experience for both users of the calibrator and the Radiation Protection Officer; the radiation protection program; description of the specific Mobile Repair Facility with trailer containing the 120 curie Cesium-137 source; operating and emergency procedures; and waste disposal associated with wipe testing and/or defective radioactive material.

(b) (6)
By direction

Copy to:
BUMED (Code 74)
CMC - (CSY-11)

Informed (b) (6) by phone — Air Mailed To Lab This date (5/19/69)

(b) (6)

61457 - 5/19/69

9900
Ser 101 - 0516
MAY 19 1969

FIRST ENDORSEMENT ON NRDL LETTER SER 730 ALS:kmm OF 9 MAY 1969

From: Commander, Naval Electronic Systems Command
To: Chief, Isotopes Branch
Division of Materials Licensing
U. S. Atomic Energy Commission
Washington, D. C. 20545

Subj: AEC Byproduct Material License No. 04-00487-03

1. Basic letter contains a request to extend the expiration date of subject license to 31 March 1970.

2. This extension of time will permit an orderly transition for the disposal of and/or transfer to other licensed activities of all the material authorized under license No. 04-00487-03. Laboratory work assignment changes are in process and the Naval activities having need for the material will submit applications for new and/or amendments to existing licenses.

Pd/Pi/Z [redacted] (b) (6)

Copy to:
BUMED(Code 74)
NRDL, SFRAN

[redacted] (b) (6)
By direction

[redacted] (b) (6)
61457 - 5/19/69
Serial 0514-040-69

Orig signed and forwarded to AEC

19 May 1969

Telcon To [redacted] (b) (6) (8-831-3900 Ext. 240)

1. Info - relevant to control documentation to assist with the Licensing Prob. that USMC has on their Mobile Repair Facility has been Air Mailed this date. (i.e. ser 0516-103, dtd. 5/19/69)

2. [redacted] (b) (6) stated dwg. covering mtl. on the AN/UDM-7 & Calibrator received. Lab. will build shipping Crate to meet spec. when mtl. is shipped from Lab.

3. Stated we had recd. copy of ltr. to AEC, stating action Lab. had taken on non-compliance during recent Inspection. Leak tests have been performed on the (6) 90Sr sources which had inadvertently been overlooked during the Laboratory's routine leak test schedule.

5-16-69

Telcon With (b) (6) [redacted]

AN/UDM-1A Radiac Calibrators

(2) On range - Marine Corps Units - holding until M.C. licensed

(1) To be returned to American Nuclear

(1) On range
(1) In storage } (1) or both may go to NOL

(1) Other type shield than UDM-1A

San Clemente Testing

(b) (6) [redacted] (Chge of Project)

Plans are to continue tests even after Lab. closes. (2) - 30,000 Ci ^{90}Sr Sources

(b) (6) [redacted] - AEC - & 3M working on the (RTG SNAP Devices) letter memo - Understanding - working with NAVFAC.

Sources in Camp Park Rge - should there be not future need in Navy - may work out arrangement with GE to take back (lge sources for Range). Has written Probst DOT relevant to shipping these sources.

U. S. NAVAL RADIOLOGICAL DEFENSE LABORATORY
SAN FRANCISCO, CALIFORNIA 94135

IN REPLY REFER TO:
730-530
AK:kmm
12 May 1969

From: Commanding Officer
To: U.S. Atomic Energy Commission, Division of Compliance, Region V, 2111 Bancroft Way, Berkeley, California 94704

Subj: Naval Radiological Defense Laboratory Byproduct Material License No. 04-00487-03 (4-487-3); item of noncompliance

Ref: (a) USAEC, Div. of Compliance, Region V, ltr (enclosure Form AEC-592) dtd 29 Apr 1969

1. The item of noncompliance referred to in reference (a) was a result of inadvertently overlooking these six millicurie amount, strontium-90 sealed sources on the routine leak test schedule.

2. The sources were leak tested on 7 May 1969 and the results indicated that all were well below the limits of Condition 12c of subject license.

(b) (6)

By direction

Copy to:
NAVELEXSYSCOM (b) (6)

Rec'd. 5/19/69

9673
100
700
A730
214C

UNITED STATES
ATOMIC ENERGY COMMISSION
DIVISION OF COMPLIANCE
REGION V
2111 BANCROFT WAY
BERKELEY, CALIFORNIA 94704

TELEPHONE: 841-3121
EXT. 651

April 29, 1969

Department of the Navy
U.S. Naval Radiological Defense
Laboratory
San Francisco Bay Naval Shipyard
San Francisco, California 94135

Attention: Captain [redacted] (b) (6), USN

Gentlemen:

This letter relates to the discussion Mr. [redacted] (b) (6) of this office held with Messrs. [redacted] (b) (6) and [redacted] (b) (6) of your staff at the conclusion of the recent inspection of AEC license No. 4-487-3. In particular, as a result of this inspection, certain of your licensed activities appear to be in noncompliance with AEC requirements. The item and reference to the pertinent requirement are listed in paragraph 5 on Form AEC-592, enclosed.

The purpose of this letter is to give you an opportunity to advise us in writing of (a) your position concerning this item, (b) any corrective steps you may have taken or plan to take with respect to this item listed on the attached form, and (c) the date all corrective action was or will be completed.

Your reply should be sent to us within 20 days of the date of this letter to assure that it will receive proper attention in our further evaluation of the matter.

Should you have any questions concerning this matter, you may communicate directly with this office.

Sincerely,

[redacted] (b) (6)

Director

Enclosure:
Form AEC-592

cc: Commander
Naval Electronics Systems Command
Baileys Crossroads, Virginia
Attn: [redacted] (b) (6)

690960

Form AEC-592
(1-63)

UNITED STATES ATOMIC ENERGY COMMISSION
DIVISION OF COMPLIANCE

1. LICENSEE	2. REGIONAL OFFICE
Department of the Navy U.S. Naval Radiological Defense Lab San Francisco Bay Naval Shipyard San Francisco, California 94135	Region V, Division of Compliance U. S. Atomic Energy Commission 2111 Bancroft Way Berkeley, California 94704
3. LICENSE NUMBER 4-487-3	4. DATE(S) OF INSPECTION April 21-24, 1969

5. The following activities under your license (identified in Item No. 3 above) appear to be in noncompliance with AEC regulations or license requirements, as indicated.

Leak tests of six millicurie level strontium-90 sealed sources (serial Nos. 41, 42, 46, 50, 52 and 73) were not performed every six months as required by Condition 12A(1) of the license.

690960

Supplementary page None Attached. (b) (6) [redacted] 4/29/69

AEC Compliance Inspector Date

ORIGINAL: LICENSEE COPIES: ☐ CO REGION ☐ CO HEADQUARTERS ☐ L&R HEADQUARTERS

U.S. GOVERNMENT PRINTING OFFICE: 1963—O-665311

From: USNRDL

730-373
AK:kmm

9 MAY 1968

Rec'd. 5/15/68
(N. Cal. for USS DIXIE (AS-37))

AIRMAIL

From: Commanding Officer and Director
To: Supervisor of Shipbuilding, USN, General Dynamics Corp., Quincy Division, Quincy, Mass. 02169

Subj: Plutonium-239/Beryllium Neutron Source; request receipt for

Ref: (a) NAVELECSYSCOM Dispatch 191500Z Apr 1968
(b) BUSHIPS INST 9890.10 "Accountability for Special Nuclear Material Utilized in Connection with Naval Nuclear Propulsion Plants"
(c) NAVELECSYSCOM ltr 10330/1 Ser 05163-67 dtd 21 Aug 1966, "Radiac Equipment; Safety Procedures Concerning Plutonium Used In"

Encl: (1) Shipping Document DD Form 1149, N62479-8114-0860 dtd 23 Apr 1968

1. In accordance with reference (a), one 80 gram (5 curies) Plutonium-239/Beryllium Neutron Source (NUMEC 800-H-52) for use with the AN/UDM-5, Slow Neutron Flux Generator was shipped to your activity for the USS DIXON AS-37 on 1 May 1968 as indicated in enclosure (1).

2. The Plutonium contained in this source was transferred from the U. S. Atomic Energy Commission to the Department of Defense under the provisions of Chapter 9, Section 91 (B) of the Atomic Energy Act of 1954, putting the custody and accountability under the responsibility of the Department of the Navy. Procedures for maintaining accountability for special nuclear material transferred to the Department of the Navy are outlined in reference (b).

3. Reference (c) specifies procedures for the safe possession and use of Plutonium used in the AN/UDM-5.

730-373
AK:kmm

4. It is requested that receipt for the 80 grams (5 curies) of Plutonium contained in this source be forwarded to this command, attention Code 730.

(b) (6) [redacted]

By direction

Copy to:(w/o encl)
NAVELECSYSCOM (Codes 05162 & 05163)
USAEC SFOO
USS DIXON AS-37

5-6-69

Telcon With [redacted] (NRDL)

1. Preparing a listing of all radioactive mtls. at the Laboratory. Some sources & devices may be salvagable for other uses at other locations & some may be xferred to new locations which will handle programs which use the mtls.

2. Hope to have listing completed this week & fwd. copy to NAUEHEX.

3. Laboratory concerned about mtl. which may be shipped being in containers which meet DOT Regulations. I stated these regs. must be adhered to.

4. Applications for renewal of license in process. Suggested request an extension of expiration date to 31 Dec. 1969 which would cover Lab. during this transferral period. Talked to REC & they will work with Navy.

5. Decontamination of areas after dis-establishment will be necessary.

U. S. NAVAL RADIOLOGICAL DEFENSE LABORATORY
SAN FRANCISCO, CALIFORNIA 94135

IN REPLY REFER TO:
730
ALS:kmm
9 May 1969

From: Commanding Officer
To: Chief, Isotope Branch, Division of Materials Licensing, U. S. Atomic Energy Commission, Washington, D. C. 20545
Via: Commander, Naval Electronic Systems Command, (Code 05163), Munitions Building, Room 4713, Nucleonics Branch, 18th and Constitution Avenues, Washington, D. C. 20390

Subj: AEC Byproduct Material License No. 04-00487-03; information concerning

1. Reference is made to a phone conversation between Mr. (b) (6) [redacted] of the DML and Mr. (b) (6) [redacted] of NRDL on April 7, concerning programs, use locations and possession limits for byproduct materials used under the subject license.

2. As outlined by a later phone conversation on 1 May 1969, the usage of byproduct material under the subject license will undergo a drastic change in the downward direction due to the planned closure of this Laboratory by 31 December 1969. Accordingly, it is requested that a one-year extension of the existing license be granted. Starting 1 July 1969, the main activities will be the disposition and transfer to other licensed activities of all byproduct materials held under the license.

3. In addition, information is requested as to AEC requirements for, after Laboratory closure, maintenance of past records relating to the several licenses held by NRDL, e.g., monitoring surveys, air samples, source wipes, radiological safety committee actions, photodosimetry, etc.

(b) (6) [redacted]
By direction

UNITED STATES
ATOMIC ENERGY COMMISSION
DIVISION OF COMPLIANCE
REGION V
2111 BANCROFT WAY
BERKELEY, CALIFORNIA 94704

TELEPHONE: 841-5121
EXT. 651

April 29, 1969

Reviewed with [redacted] on 5/6/69 during phone call. Ltr. in preparation answering this. Comm.

Department of the Navy
U.S. Naval Radiological Defense Laboratory
San Francisco Bay Naval Shipyard
San Francisco, California 94135

Attention: Captain [redacted], USN

Gentlemen:

This letter relates to the discussion Mr. [redacted] of this office held with Messrs. [redacted] and [redacted] of your staff at the conclusion of the recent inspection of AEC license No. 4-487-3. In particular, as a result of this inspection, certain of your licensed activities appear to be in noncompliance with AEC requirements. The item and reference to the pertinent requirement are listed in paragraph 3 on Form AEC-592, enclosed.

The purpose of this letter is to give you an opportunity to advise us in writing of (a) your position concerning this item, (b) any corrective steps you may have taken or plan to take with respect to this item listed on the attached form, and (c) the date all corrective action was or will be completed.

Your reply should be sent to us within 20 days of the date of this letter to assure that it will receive proper attention in our further evaluation of the matter.

Should you have any questions concerning this matter, you may communicate directly with this office.

Sincerely,

Original Signed by
[redacted]
Director

Enclosure:
Form AEC-592

cc: Commander
Naval Electronics Systems Command
Baileys Crossroads, Virginia
Attn: [redacted]

Form AEC-592
(6-63)

UNITED STATES ATOMIC ENERGY COMMISSION
DIVISION OF COMPLIANCE

1. LICENSEE	2. REGIONAL OFFICE
Department of the Navy U.S. Naval Radiological Defense Lab San Francisco Bay Naval Shipyard San Francisco, California 94135	Region V, Division of Compliance U. S. Atomic Energy Commission 2111 Bancroft Way Berkeley, California 94704
3. LICENSE NUMBER 4-487-3	4. DATE(S) OF INSPECTION April 21-24, 1969

5. The following activities under your license (identified in Item No. 3 above) appear to be in noncompliance with AEC regulations or license requirements, as indicated.

Leak tests of six millicurie level strontium-90 sealed sources (serial Nos. 41, 42, 46, 50, 52 and 73) were not performed every six months as required by Condition 12A(1) of the license.

Original Signed By
(b) (6) [redacted]
AEC Compliance Inspector

4/29/69
Date

Supplementary page None attached.

ORIGINAL: LICENSEE. COPIES: ☐ CO REGION ☐ CO HEADQUARTERS ☐ L&R HEADQUARTERS.

U.S. GOVERNMENT PRINTING OFFICE: 1963—O-685311

552-995

9900
Ser 59 - 0516
19 March 1969

FIRST ENDORSEMENT ON USNRDL LETTER 730-506 AK/ AS:kmm OF 13 MAR 1969

From: Commander, Naval Electronic Systems Command
To: Chief, Isotopes Branch
Division of Materials Licensing
U. S. Atomic Energy Commission
Washington, D. C. 20545

Subj: AEC Byproduct Material License No. 04-00487-03

1. Basic letter with enclosure contains an application for renewal of subject license.

2. This material has been reviewed and includes the completed AEC-313 Form with updated supplemental information in its entirety. Supplement three (Items 6(a) and (b)) include changes in the amount of activity (i.e., "C", "D", "I", "O", and "U") and additional items (i.e., "B", "X", and "R") to material presently authorized under AEC License No. 04-00487-03.

3. All byproduct material is or will be used in the Laboratory's basic and applied research program with emphasis upon factors relevant to the requirements of the military services.

(b) (6) [redacted]
(b) (6)
By direction

Copy to:
BUMED(Code 74)
NRDL, SFRAN

(b) (6) [redacted]
61457 - 3/19/69

Orig.signed and forwarded to AEC

Naval Radiological Defense Laboratory
San Francisco Bay Naval Shipyard
San Francisco, California 94135

730-506
AK/ALS:kmm
13 MAR 1969

AIRMAIL

Rec'd: 3/17/69 & fwded to AEC by 1st End. Ser 0516 59 of 19 Mar. 1969

From: Commanding Officer
To: Chief, Isotope Branch, Division of Materials Licensing, U. S. Atomic Energy Commission, Washington, D. C. 20545
Via: Commander, Naval Electronic Systems Command, (Code 05163), Munitions Building, Room 4713, Nucleonics Branch, 18th & Constitution Avenues, Washington, D. C. 20390

Subj: AEC Byproduct License No. 04-00487-03; request for renewal of

Encl: (1) Application for Byproduct Material License (Renewal) AEC Form-313, with enclosures

1. This Laboratory's application for renewal of Byproduct Material License 04-00487-03, enclosure (1), is submitted for review and approval. The material submitted in support of the application has been recently updated and represents current radioisotope needs and methods of utilization.

2. Any clarification or further information needed in support of this application will be supplied upon request.

(b) (6) [redacted]
By direction

Form AEC-313
(8-64)
10 CFR 30

UNITED STATES ATOMIC ENERGY COMMISSION

APPLICATION FOR BYPRODUCT MATERIAL LICENSE

Form approved.
Budget Bureau No. 38-R027

INSTRUCTIONS.—Complete Items 1 through 16 if this is an initial application or an application for renewal of a license. Information contained in previous applications filed with the Commission with respect to Items 8 through 15 may be incorporated by reference provided references are clear and specific. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail two copies to: U.S. Atomic Energy Commission, Washington, D.C., 20545, Attention: Isotopes Branch, Division of Materials Licensing. Upon approval of this application, the applicant will receive an AEC Byproduct Material License. An AEC Byproduct Material License is issued in accordance with the general requirements contained in Title 10, Code of Federal Regulations, Part 30, and the Licensee is subject to Title 10, Code of Federal Regulations, Part 20.

1. (a) NAME AND STREET ADDRESS OF APPLICANT. (Institution, firm, hospital person, etc. Include ZIP Code.)

Naval Radiological Defense Laboratory
San Francisco Bay Naval Shipyard
Hunters Point
San Francisco, California 94135

(b) STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED. (If different from 1(a). Include ZIP Code.)

(See Supplement 1)

2. DEPARTMENT TO USE BYPRODUCT MATERIAL

Any.

3. PREVIOUS LICENSE NUMBER(S). (If this is an application for renewal of a license, please indicate and give number.)

Renewal of License No. 04-00487-03

4. INDIVIDUAL USER(S). (Name and title of individual(s) who will use or directly supervise use of byproduct material. Give training and experience in Items 8 and 9.)

As approved by the Naval Radiological Defense Laboratory Radiological Safety Committee.

5. RADIATION PROTECTION OFFICER. (Name of person designated as radiation protection officer if other than individual user. Attach resume of his training and experience as in Items 8 and 9.)

(See Supplement 2)

6. (a) BYPRODUCT MATERIAL. (Elements and mass number of each.)

(See Supplement 3)

(b) CHEMICAL AND/OR PHYSICAL FORM AND MAXIMUM NUMBER OF MILLICURIES OF EACH CHEMICAL AND/OR PHYSICAL FORM THAT YOU WILL POSSESS AT ANY ONE TIME. (If sealed source(s), also state name of manufacturer, model number, number of sources and maximum activity per source.)

(See Supplement 3)

7. DESCRIBE PURPOSE FOR WHICH BYPRODUCT MATERIAL WILL BE USED. (If byproduct material is for "human use," supplement A (Form AEC-313a) must be completed in lieu of this item. If byproduct material is in the form of a sealed source, include the make and model number of the storage container and/or device in which the source will be stored and/or used.)

The Naval Radiological Defense Laboratory is a Laboratory engaged in basic and applied research on the physical, chemical and biological effects of nuclear and thermal radiation, with particular emphasis upon those factors relating to the requirements of the military services.

(b) (6) [redacted]

Byproduct material will be used in research and development as defined in Section 30.4(q) of 10 CFR 30.

(Continued on reverse side)

683456

TRAINING AND EXPERIENCE OF EACH INDIVIDUAL NAMED IN ITEM 4 (Use supplemental sheets if necessary)

8. TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB (Circle answer)	FORMAL COURSE (Circle answer)
a. Principles and practices of radiation protection	(See Item 4 and Supplement 2)		Yes No	Yes No
b. Radioactivity measurement standardization and monitoring techniques and instruments			Yes No	Yes No
c. Mathematics and calculations basic to the use and measurement of radioactivity			Yes No	Yes No
d. Biological effects of radiation			Yes No	Yes No

9. EXPERIENCE WITH RADIATION. (Actual use of radioisotopes or equivalent experience.)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
		(See Item 4 & Supplement 2)		

10. RADIATION DETECTION INSTRUMENTS. (Use supplemental sheets if necessary.)

TYPE OF INSTRUMENTS (Include make and model number of each)	NUMBER AVAILABLE	RADIATION DETECTED	SENSITIVITY RANGE (mr/hr)	WINDOW THICKNESS (mg/cm²)	USE (Monitoring, surveying, measuring)
(See Supplement 4)					

11. METHOD, FREQUENCY, AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED ABOVE.

(See Supplement 5)

12. FILM BADGES, DOSIMETERS, AND BIO-ASSAY PROCEDURES USED. (For film badges, specify method of calibrating and processing, or name of supplier.)

(See Supplement 6)

INFORMATION TO BE SUBMITTED ON ADDITIONAL SHEETS IN DUPLICATE

13. FACILITIES AND EQUIPMENT. Describe laboratory facilities and remote handling equipment, storage containers, shielding, fume hoods, etc. Explanatory sketch of facility is attached. (Circle answer) Yes No (See Supplement 7)

14. RADIATION PROTECTION PROGRAM. Describe the radiation protection program including control measures. If application covers sealed sources, submit leak testing procedures where applicable, name, training, and experience of person to perform leak tests, and arrangements for performing initial radiation survey, servicing, maintenance and repair of the source.

(See Supplement 8)

15. WASTE DISPOSAL. If a commercial waste disposal service is employed, specify name of company. Otherwise, submit detailed description of methods which will be used for disposing of radioactive wastes and estimates of the type and amount of activity involved. (See Supplement 9)

CERTIFICATE (This item must be completed by applicant)

16. THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATE ON BEHALF OF THE APPLICANT NAMED IN ITEM 1, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PART 30, AND THAT ALL INFORMATION CONTAINED HEREIN, INCLUDING ANY SUPPLEMENTS ATTACHED HERETO, IS TRUE AND CORRECT TO THE BEST OF OUR KNOWLEDGE AND BELIEF.

Naval Radiological Defense Laboratory

Applicant named in item 1

Date March 13, 1969

By: (b) (6) [redacted] (b) (6)

LCDR, MC, USNR, Delegate

Chairman, Radiological Safety Committee

Title of certifying official

WARNING.—18 U. S. C., Section 1001; Act of June 25, 1948; 62 Stat. 749; makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

* U.S. GOVERNMENT PRINTING OFFICE : 1964 O—745-382

SUPPLEMENT 1 (Item 1 (b))

Material will be possessed and used by the Naval Radiological Defense Laboratory, (NRDL), San Francisco, California 94135, and may also be used at Navy, Army and Air Force facilities provided such use is under the direct supervision and control of NRDL personnel and in accordance with procedures established by NRDL Radiological Safety Committee. It may be sent out to other AEC or State licensed activities.

SUPPLEMENT 2 (Item 5)

Radiological Safety Committee Members and Qualifications

Dr. (b) (6) [redacted], Chairman

Head, Biological and Medical Sciences Division, NRDL, April 1959 to present; Head, Biophysics Branch, NRDL, 1956 - April 1959; Head, Thermal Injury Branch, NRDL, 1952 - 1956; Investigator in Thermal Injury Branch, NRDL, April 1951 - September 1952; Assistant Professor of Pharmacology, George Washington University, Washington, D. C., January 1950 - April 1951.

Dr. (b) (6) [redacted], Jr., LCDR, MC, USNR, Alternate Chairman

Radiological Medical Director, Medical Department, NRDL, October 1968 to present; Medical Investigator, Experimental Pathology Branch, Biological and Medical Sciences Division, NRDL, July 1968 to present; Resident in Radiotherapy and Nuclear Medicine, University of Wisconsin Hospital, Madison, Wisconsin, 1965 - 1968; Resident in Radiotherapy, Stanford University Hospital, Palo Alto, California, 1964 - 1965; Internship in Medicine and Surgery, University of Virginia Hospital, Charlottesville, Virginia, 1963 - 1964; M.D. University of Rochester Medical School, Rochester, New York, 1963; B.S. Nuclear Engineering, North Carolina State University, Raleigh, North Carolina, 1958; Board Certified in Radiotherapy by American Board of Radiology.

Mr. (b) (6) [redacted], Alternate Chairman

Head, Health Physics Division, NRDL, February 1962 to date; Head, Radiological Safety Branch, Health Physics Division, NRDL, July 1956 - February 1962; Health Physicist, NRDL, October 1951 - July 1956; Health Physicist, General Electric Corp., Hanford Atomic Products Operation, January 1948 - October 1951.

Dr. (b) (6) [redacted]

Head, Nuclear Technology Division, NRDL, November 1966 to date; Head, Chemical Technology Division, NRDL, September 1964 - November 1966; Head, Countermeasures Evaluation Branch, Military Evaluations Division, NRDL, May 1959 - September 1964; Radiological Chemist, Military Evaluations Division, NRDL, December 1956 - May 1959; Radiological Chemist, Chemical Technology Division, NRDL, March 1952 - December 1956.

Supplement 2 (Item 5, Continued)

Dr. (b) (6) [redacted]

Head, Radiation Physics Division, NRDL, November 1966 to date; Head, Nucleonics Division, NRDL, November 1965 - November 1966; Physics Consultant to Scientific Director, NRDL, 1962 - 1965; Fulbright Research Fellow, Aarhus University, Aarhus, Denmark, 1960-1962; Head, Nucleonics Division, NRDL, April 1960 - August 1961; Head, Radiation Characteristics and Effects Branch, NRDL, 1959 - 1960; Head, Nuclear Radiation Branch, NRDL, 1953 - 1959; Assistant Professor of Physics, Washington University, St. Louis, Missouri, 1948 - 1953; Research Assistant, Indiana University, Bloomington, Indiana, 1946 - 1948; Teaching Assistant, Indiana University, Bloomington, Indiana, 1940 - 1942.

Dr. (b) (6) [redacted]

Head, Physical Sciences Division, NRDL, November 1966 to date; Acting Head, Nuclear Research Branch, Physical Sciences Division, NRDL, November 1966 to date; Head, Nucleonics Division, NRDL, October 1962 - November 1966; Director, Cyclotron Project, NRDL, November 1965 - 1966; Head, Nucleonics Division (Temp.), NRDL, 1961 - 1962; Head, Nuclear Radiation Physics Branch, Nucleonics Division, NRDL, 1958 - 1961; Senior Investigator, Nuclear Physicist, Shielding Section, Nucleonics Division, NRDL, 1952 - 1957.

Mr. (b) (6) [redacted]

Head, Technical Planning and Management Office, NRDL, March 1964 to date; Head, Long-Range Planning Group, Technical Planning and Management Office, NRDL, March 1964 to date; Head, Applied Research Branch, Chemical Technology Division, NRDL, 1961 -1964; Supervisor and Research Specialist, Atomics International, 1959 - 1961; Head, Analytical and Standard Branch, Chemical Technology Division, NRDL, July 1957 - March 1960; Investigator, Chemical Technology Division, NRDL, 1948 - 1955.

NOTE: Each member has two (2) alternates whose qualifications are commensurate with their positions, usually Branch Heads.

SUPPLEMENT 3 (Items 6 (a) and (b)

Byproduct material (element and mass number)	Chemical and/or physical form	Maximum amount radioactivity which licensee may possess at any one time
A. Any byproduct material with Atomic Nos. 1-84, inclusive	A. Any	A. 5 curies of each
B. Actinium-227	B. Any	B. 10 millicuries
C. Americium-241	C. Any	C. 200 millicuries
D. Americium-241	D. Monsanto Research Corp. Model MRC-G-SS-W-AM Sealed Source	D. 2 sources of 2 curies each
E. Americium-243	E. Any	E. 1 millicurie
F. Barium-140	F. Any	F. 100 curies
G. Californium-252	G. Any	G. 1 millicurie
H. Cesium-137	H. Any	H. 20 curies
I. Cesium-137	I. Sealed Sources	I. 3000 curies
J. Chromium-51	J. Any	J. 220 curies
K. Cobalt-60	K. Sealed Sources	K. 5000 curies
L. Curium-244	L. Any	L. 1 millicurie
M. Gold-198	M. Any	M. 200 curies
N. Hydrogen-3	N. Any	N. 100 curies
O. Hydrogen-3	O. Accelerator Targets	O. 400 curies
P. Lanthanum-140	P. Any	P. 100 curies
Q. Neptunium-237	Q. Any	Q. 10 millicuries
R. Polonium-210	R. Any	R. 10 millicuries
S. Promethium-147	S. Any	S. 200 curies
T. Promethium-147	T. Oxide pellets and powder	T. 10,000 curies
U. Strontium-90	U. Any	U. 500 curies
V. Tantalum-182	V. Any	V. 10 curies
W. Thulium-170	W. Alloy pellets	W. 8,000 curies
X. Thulium-171	X. Alloy pellets	X. 4,000 curies
Z. Yttrium-90	Z. Any	Z. 15 curies
AA. Mixed Fission Products	AA. Any	AA. 100 curies

SUPPLEMENT 4 (Item 10)

Instrument	Type	Qty on Hand	Range	Purpose
Victoreen Vamp Model 808A	End Window GM	1	0-50 mr/hr	β-γ continuous area monitoring alarm system
Victoreen Vamp Model 808B	End Window GM	1	0-100 mr/hr	β-γ continuous area monitoring alarm system
Eberline E112B	Side Window GM	6	0-20 mr/hr	β-γ dose rate and contamination monitoring
Nuclear 1615B	End Window GM	3	0-50,000 c/m	β-γ dose rate and contamination monitoring
AN/PDR 27	End Window GM Enclosed GM	67	0-5 mr/hr 0-500 mr/hr	β-γ dose rate and contamination monitoring
El-Tronics CP3D (Cutie Pie)	Ionization Chamber	13	0-10 rad/hr	β-γ dose rate monitoring
CP3DM (Cutie Pie)	Ionization Chamber	25	0-10 rad/hr	β-γ dose rate monitoring
CP3DMS (Cutie Pie)	Ionization Chamber	10	0-100 rad/hr	β-γ dose rate monitoring
AN/PDR-TIB	Ionization Chamber	18	0-50 r/hr	γ dose rate monitoring
Keleket K-240	Five Fold (GM)	1	10^4 Counts	β-γ hand & foot counter
Austin, Model 4	Five Fold (GM)	2	10^4 Counts	β-γ hand & foot counter
IM-113 A/PDR	Side Window GM	26	0-20 mr/hr	β-γ dose rate and contamination monitoring
Juno No. 3	Ionization Chamber	5	0-5000 mr/hr	α, β and γ dose rate and contamination monitoring
Berkeley 2750 (Modified)	End Window GM (with thin window)	2	0-50,000 c/m	Low energy beta monitoring
Eberline (PAC 3G)	Gas proportional	12	0-100,000 c/m	α contamination monitoring
Eberline (PAC ISA)	Scintillator	8	0-2,000,000 c/m	α contamination monitoring
AN/PDR-49A	BF_3 proportional counter	3	2.5×10^4 n/cm^2/sec slow or fast	neutron dose rate monitoring
AN/PDR-47	Proton recoil proportional counter	3	0-500 mrep/hr fast	fast neutron dose rate monitoring
Ludlum Model 11 (with Bonner spheres)	Scintillation	1	0-50,000 cpm	fast neutron detection and energy determination

Supplement 4 (Item 10, Continued)

Instrument	Type	Qty on Hand	Range	Purpose
Tritium Probe Eberline Model TP-1, Used with Eberline Model PAC3G	Gas proportional	1	10^{-6} μc/cc sensitivity	Portable tritium surface monitoring
NRDL Tritium Meter	Ionization Chamber	1	10^{-3} μc/cc sensitivity	Tritium air contamination monitoring
T-289 Tritium Detector	Ionization Chamber	3	10^{-5} μc/cc sensitivity	Tritium air contamination Monitoring
T-290 Tritium Detector	Ionization Chamber	2	10^{-3} μc/cc sensitivity	Tritium air contamination monitoring
Dosimeters IM-9E/PD	Direct reading pocket chamber	73	0-200 mr	γ personnel dosimetry
Dosimeter, Bendix Model 866	Direct reading pocket chamber	19	0-1 R	γ personnel dosimetry
Dosimeter, Bendix Model 611	Direct reading pocket chamber	25	0-5 R	γ personnel dosimetry
Dosimeter IM-19B/PD	Direct reading pocket chamber	25	0-10 R	γ personnel dosimetry
Dosimeter, Landsverk with adjustable finger ring	Indirect reading pocket chamber	10	0-2 R	γ personnel hand dosimetry
Reader-Charger Landsverk	Electrometer	1	--	Reading and charging indirect reading pocket chamber
Film Badge	DuPont 555 & 1290 5 filter film holder	5000	25 mr to about 2500 r	β-γ personnel dosimetry
Film Badge	Eastman NTA film	100	20 mrem to 10,000 mrem	Fast neutron personnel dosimetry
Film Badge finger ring	DuPont 508 and 1290	50	25 mr to about 2500 r	β-γ personnel hand dosimetry
Staplex, high volume	Air Sampler	16	25 cfm	α, β-γ aerosol sample collection
Schmidt, low volume	Air Sampler	10	1.75 cfm	α, β-γ aerosol sample collection

Supplement 4 (Item 10, Continued)

Instrument	Type	Qty on Hand	Range	Purpose
Port-A-Vac	Air Sampler	5	6×10^5 cc/min.	α, β-γ aerosol sample collection
Eberline Air Monitor, Model AIM-3	Air Monitor	1	1,000 to 10,000 cpm	α air monitor and alarm
Nuclear-Chicago Model 151A with scaler interchangeable end window GM & side window GM	GM Counter	1	--	β-γ air, liquid and wipe sample counting
Baird-Atomic Model 132, scaler with end window GM	GM Counter	1	--	β-γ air, liquid and wipe sample counting
Baird-Atomic Model 135, scaler with end window GM	GM Counter	1	--	β-γ air, liquid and wipe sample counting
Hamner Scaler with scintillation counter	Scintillation Counter	1	--	α air, liquid and wipe sample counting
Nuclear-Chicago scaler Model 202, with interchangeable alpha &beta scintillation counter	Scintillation Counter	1	--	α, β air, liquid and wipe sample counting
RCL & Systron Model 1091-3, Channel Spectrometer with 4" x 4" sodium iodide thallium activated crystal (256 Channel)	Scintillation Counter	1	--	γ air, liquid and wipe sample counting and isotope identification
Nuclear-Chicago Model 186A, scaler with gas proportional counter	Gas proportional	1	--	α, beta and low energy beta air, liquid and wipe sample counting
Berkeley 2750	Side Window GM	27	0-50,000 c/m	β-γ dose rate and contamination monitoring

SUPPLEMENT 5(Item 11)

Radiation detecting instruments in use are calibrated every three months or as needed (instrument malfunctions, etc.) by electronic technicians on a calibrated source range. Sources used are Co-60, Cs-137, Pu-Be, U-238. Prior to use of the instrument a check is made with a radioactive test sample (Ra-226, Co-60, Sr-90, Pu-239) to insure instrument operation. Prior to being put into use from storage instruments are checked and calibrated.

Counting systems are initially calibrated for operating plateaus and checked daily with calibrated standards for instrument performance. When counting systems are serviced, they are then recalibrated.

Occasionally checks are made of air samplers to establish the air flow rate.

SUPPLEMENT 6 (Item 12)

The standard film badge dosimeter used at NRDL has five filters of thickness 0.032" aluminum, 0.027" lead, 0.015 cadmium, and 0.010" paper and 0.125" plastic. It can be calibrated so as to give effective energy information as well as dosage information. The film used is a two-film packet, containing DuPont 555 and 1290 film, and can measure gamma exposures from 25 mr to about 2500 r.

The DuPont 555 and 1290 films are calibrated for response to beta radiation with a normal uranium plaque, and for response to gamma radiation with a cobalt-60 source, and various energies of X-ray, using NBS-certified thimble chambers as a standard. All calibration exposures are made with the film inside the badge.

Neutron film badges (NTA film) are also used when neutron sources are handled, or when personnel are in proximity to nuclear reactors or neutron producing particle accelerators. A neutron film badge service is supplied by a commercial firm (Radiation Detection Company, Mt. View, California).

Finger ring film badges (beta-gamma) are used whenever there is the possibility of hand exposure in excess of that measured by the body badge. A finger ring service is supplied by a commercial firm (Radiation Detection Company, Mt. View, California).

Bioassay screening of personnel is accomplished by gross beta determinations. Rare earths and heavy metals are precipitated from urine by a reagent containing ammonium oxalate, oxalic acid and acetic acid. The precipitate is beta counted.

Tritium in urine is measured by liquid scintillation counting. When indicated, barium, strontium, radium and polonium are separated and counted by procedures outlined in USNRDL-TR-451, "Analytical Procedures at the USNRDL for the Determination of Certain Radioelements in Urine" by Shipman and Weiss.

A whole-body counter with a 4" x 4" NaI crystal shielded by a 8" iron wall room and coupled to a 1024 channel spectrometer provides a means for estimating the quantity and identity of gamma-emitters in the body. This Counter is used in cases of suspected body uptake of certain radioelements.

SUPPLEMENT 7 (Item 13)

Facilities and Equipment

The Naval Radiological Defense Laboratory is located in the San Francisco Bay Naval Shipyard, Hunters Point Division, San Francisco, California. The Laboratory proper is Building 815, a six-floor structure housing the major portion of NRDL's personnel and equipment. Other buildings and facilities located at SFBNS includes:

(1) Building 816 -- 2 MEV, Van de Graff

(2) Building 820 -- Cyclotron

(3) Building 821 -- 1 MEV X-Ray Facility

(4) Building 364 -- Animal Irradiation Facility

(5) Building 506/529 -- Neutron Generator

(6) Building 707 -- Animal Breeding/Waste Storage

(7) Buildings 830/831 -- Animal Facilities

The Naval Radiological Defense Laboratory also has facilities at Camp Parks, a standby Army Base, near Pleasanton, California. Major building and facilities at Camp Parks include:

1. Building 310 - Headquarters Facilities
2. Building 131 - Hot cell and laboratory
3. Building 331 - Shop and change house
4. Building 305 - Greenhouse Laboratory
5. Plant Uptake area
6. Explosive Test Pond
7. Surface Roughness Area
8. Target Complex Area
9. Radiation Range (By-Product License No. 04-00487-08)
10. Animal Farm

The Camp Parks usage is anticipated to be at the curie level of isotopes of strontium, cesium, cerium, ruthenium, zirconium, and niobium. The Camp Parks usage will be in connection with the Office of Civil Defense sponsored plant uptake and plant dosage studies. These studies involves the confinement of radioisotope to plant growth chambers. The Hot Cell at Camp Parks will be used in the preparation of soils labeled with radioisotopes.

The major radioisotope use location, under Byproduct License 04-00487-03, is Building 815, SFBNS. The SFBNS uses, other than in Building 815, are in Building 816 (tritium targets), Building 364 (sealed Co^{60} source) Building 506/529 (tritium targets) and Building 707 (packaged waste materials).

Building 815 is the location for use of about 90% of the radioisotopes under License 04-00487-03, both as sealed sources and as unsealed radioisotopes. Building 815 is a six-floor structure containing more than 100 chemistry, physics, and biology-type laboratory spaces. About one-third of these spaces utilize radiation material. All of the chemistry and biology laboratories (into which the use of unsealed radioisotopes is limited) are equipped with an average of two fume hoods per space. In physics laboratories, the use of radioactive materials is limited to sealed or confined quantities.

In general, curie-quantities of radioisotopes are used as sealed sources, housed in shielding containers with beam ports. Their use is in source "ranges" high radiation areas secured against entry and access controlled by locked doors.

Smaller, microcuries to millicuries quantities in use by individual investigations are stored in individual shields as needed, often the original shipping container, or in lead brick caves in hoods.

Building 815 is restricted in its entirety, for security and radiation control purposes. Film badging for all personnel and visitors is accomplished at the entrance.

Each floor of Building 815 has its own air intake and exhaust systems. Air is drawn in at each floor level and exhausted to the roof through room and hood exhaust ducts. Hood exhausts are filtered through fiberglass filters. All filters are changed as performance requires.

The policy for hood work is that no aerosol producing operations are to be conducted in the hoods; special containment systems such as glove boxes are used instead. One hood, however, has been outfitted with a separate high capacity ultra filter exhaust system, in our radioisotope storage room when shipments are opened and aliquots made for investigators. The face velocity of all hoods is maintained at 100-125 linear feet per minute.

For failures within the air supply system, i.e., fan breakdown, etc., there is a provision for switching to alternate fans. In case of a power failure, after a period of nine seconds, emergency power is supplied to the exhaust fans only. It is estimated that, under these conditions, about 30% of the normal supply air is drawn into the building through the supply system ducts, through the supply system ducts, though the supply fans are off.

Supplement 7 (Item 13, Continued)

Handling and storage equipment available at NRDL includes the following:

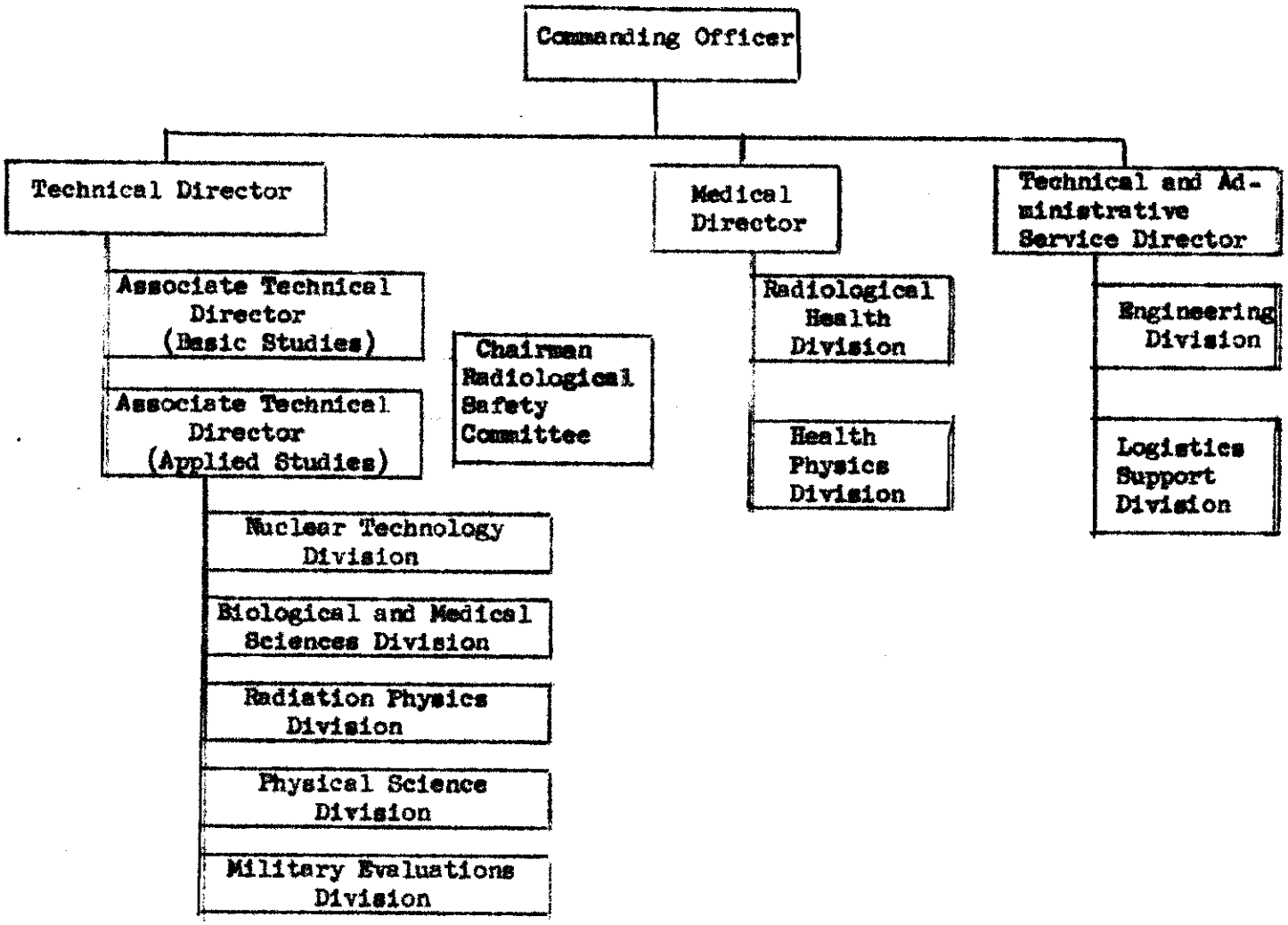
1. Twelve shipping containers, lead-shielding thickness ranging from 2" to 11".
2. 100 storage containers, 1" lead.
3. 32 storage containers, 2" lead.
4. 28 storage containers, 3" lead.
5. One concrete-shielded storage vault for isotope storage containers.
6. One concrete-shielded storage vault for radiation sources.
7. Two-fenced-storage areas for contaminated equipment.
8. Twenty remote pipettes for isotope solution transfers.
9. Two sets of master-slave manipulators.
10. Two concrete-walled hot cells.
11. Four lead-shielded glove boxes.
12. Twelve gloves boxes, unshielded.
13. Miscellaneous remote-handling tongs.
14. Sixteen radiobiological laboratories with 43 fume hoods.
15. Twenty-three radiochemical laboratories with 43 fume hoods.
16. Three radiophysics laboratories with 3 fume hoods.
17. One mobile radiological safety monitoring and protective equipment supply station.
18. Portable shielded master-slave manipulator.
19. Emergency decontamination equipment station.
20. Specifically marked dry and liquid radioactive waste containers.

SUPPLEMENT 8 (Item 14)

Radiation Protection Program

1. Introduction. The Naval Radiological Defense Laboratory is engaged in basic and applied research on the physical and biological effects of nuclear and thermal radiation, with particular emphasis upon those factors relating to the requirements of the military services.

The Health Physics Division of the Laboratory is responsible for the protection of Laboratory personnel and the environment from radiological hazards. The following partial chart shows the organizational relationship of the Health Physics Division to the Laboratory:



The Radiological Safety Committee, composed of senior members of the Laboratory staff and chaired by the Head, Biological and Medical Sciences Division, is responsible for the control and use of all radioisotopes, including byproduct, source and special nuclear materials used in the Laboratory. The Committee, also is responsible for radiological safety directives, procedures, and policies and for radiological accident investigation and control. This Committee has within its scope, radiation producing machines as well as radioisotopes. The Health Physics Division is the agent for the Committee, managing the control program, maintaining records, and providing investigative services.

The control procedures detailed below are those used for all byproducts and other material defined as "accountable material" by the U. S. Atomic Energy Commission.

2. Ordering Radioactive Material

All requests to use radioactive material in Laboratory experimental programs are submitted to the Health Physics Division and described in detail all the proposed conditions under which the materials will be used. All such requests are carefully evaluated by the Health Physics Division for possible radiological hazards. On the basis of the evaluation, it may be necessary to change experimental procedures so as to eliminate or to minimize radiological hazards. Each request is then reviewed by the Radiological Safety Committee, which consists of senior members of the Laboratory staff. Upon approval by the Radiological Safety Committee, an order for the material is processed by the Logistic Support Division.

The control procedures require the use of specific forms. Individual use approval forms, NRDL Form 44 and 44A (Figures 1 and 2) are initiated by each experimenter when a particular use of radioactive material is planned. The Health Physics investigator reports his evaluation of the proposed use on NRDL Form 76, Isotope Procurement Investigation (Figure 3).

3. Receipts

All shipments of radioactive material are delivered, unopened, to the Health Physics Division. Health physicists, or technical

personnel under their supervision, open the package, conduct the necessary radiological surveys, perform any necessary decontamination, and determine by appropriate method, the activity content of the material. A record is made which shows the identity of the material, quantity, amount of activity, storage location, and use to which it is put. This record is maintained as long as the material is at the Naval Radiological Defense Laboratory. The Chairman, Radiological Safety Committee, is supplied with all necessary data to maintain these records. The control forms used are shown in Figures 4 and 5.

4. Storage

All radioactive material is stored, when not in experimental use, in a subterranean storage vault in the isotope storage room. This room has walls of 36" thick reinforced concrete and a door equipped with a key opening lock. The storage vault consists of 40 stainless steel cylinders holding four lead storage containers each. These lead containers are divided into three effective shielding thicknessess (1", 2", and 3"). The containers are removed from the storage vault by a remotely-controlled traveling crane of 3 tons capacity.

5. Experimental Use

Quantities of radioactive material are issued as needed, for experimental use. Detailed records are maintained for the Chairman, Radiological Safety Committee of the quantity issued and its location in the Laboratory. Periodic monitoring surveys are made in each laboratory space in which radioactive material is used. Special monitoring surveys are made as needed, when the experimental use so indicates.

6. Shipping

All shipments of radioactive material leaving the Laboratory are checked by the Health Physics Division to assure DOT shipping requirements are met and that the proper shipping form is prepared and transmitted.

Supplement 8 (Item 14, Continued)

7. General Health and Radiological Safety Measures

The Health Physics Division of this Laboratory is responsible for providing adequate radiological safety measures for all Laboratory personnel working in all laboratory spaces where radioactive material is handled, and special monitoring services where any experimental or maintenance operation involves an unusual radiological hazard. A personnel monitoring program provides film badges for all Laboratory personnel, pocket dosimeters for personnel engaged in certain experiments, and appropriate radioclinical examination for internal contamination for those personnel working with loose or unconfined radioactive materials. A supply of calibrated, monitor instrumentation, adequate to measure all types of radiations encountered, is maintained by the Health Physics Division for health physics and self-monitoring purposes. An active air sampling program guards against build-up of hazardous airborne concentrations of radioactive materials. All NRDL liquid effluent (except sanitary drains) is held up in storage tanks and analyzed to insure that the radioactivity concentration is below the maximum permissible concentration prior to release to the sewer system.

The Radiological Health Division of this Laboratory performs physical examinations, including radio-urinalysis, for all personnel entering or leaving the employ of the Laboratory, and additional examinations during employment as required by the nature of the work.

The NRDL regulations (U. S. Naval Radiological Defense Laboratory Safety Manual, NRDLINST P5100.11) relating to safety measures in work with radiation and radioactive materials were enclosed as Attachment 1 to previous request for Byproduct Material License 04-00487-03 renewal (NRDL ltr 730-57, DCC/ALS:kmm dated 15 Dec 1966). These regulations are distributed to all Laboratory Branches and made available to all Laboratory personnel.

8. Monitoring

In order to assure that adequate safety procedures are being followed in experiments with byproduct material, the use is checked by Health Physics personnel. The monitoring consists of surveys for radiation and contamination levels with portable radiation detection instruments and by wipes of working areas for evidence of removable activity. Air sampling is also conducted if there is a possibility of airborne activity.

Supplement 8 (Item 14, Continued)

A routine monitoring program is conducted in spaces where radioactive materials are not normally used as well as in spaces where these materials are used and stored. Periodic checks for radiation levels and removable contamination provide an overall look at the radiological situation in the Laboratory.

A continuous monitoring program is conducted to measure the radiation levels at the boundaries of the Laboratory's restricted areas and to assess the release of radioactive materials to the Laboratory's environs. Air samples are collected continuously at the extremities of the Laboratory as well as within the Nuclear Technology Division's hood exhaust system. The hood exhaust sample is monitored during collection with a warning level indicator. The fixed filter stations are changed and counted on at least a weekly basis. The restricted area boundaries are monitored for radiation levels by film badges which are changed on a monthly basis. All Laboratory liquid effluents (except sanitary drains) are held in storage tanks and assayed on a routine basis. The radioactivity concentration must be below the guide listed in 10 CFR 20 prior to release to the sewage system.

The procedures in use at NRDL for leak testing sealed sources are outlined as follows:

Tests used are capable of detecting removable contamination of 5×10^{-5} microcuries of beta-gamma emitters and 1×10^{-7} microcuries of alpha emitters. All records are kept in units of microcuries and maintained for AEC inspection as well as for inspection by interested Laboratory personnel.

Sealed sources are defined as any quantity of byproduct material above certain quantities listed in Part 31.100, Schedule A Column 2, which are contained in the completely closed package in which they are to be used.

Seal Beta-Gamma Sources: Wiped with a cotton-tipped swab, or with a filter paper material, such as Whatman #1 or #40, of 4.25 centimeter (1-5/8") diameter. Generally alcohol is used to wet the paper, although other solutions compatible with the source materials may be used. The wipe paper or swab is usually held

with tongs or mounted on a suitable extension device as required by the source configuration and/or radiation dose rate and the wipe test is performed. All horizontal and vertical surface are sampled during the test procedure, for any given sealed source. Each wipe sample is identified with a wipe sample number. This number is recorded upon the special envelope in which the wipe sample is placed, and is also recorded on the Data Sheet for Counting Information. Counting for beta-gamma wipe samples is done in either (a) a deep-well crystal scintillation counter, essentially a 4π geometry situation, or (b) in an end-window Geiger-Mueller tube detector, coupled to an electronic detecting and amplification circuit. This is essentially a 2π geometry counting. These counters are calibrated against known radioactive standards, either made from National Bureau of Standards supplied solutions, or purchased from a reliable commercial company which can supply a certified calibrated source. The disintegration per minute (d/m) figure obtained by the counting procedure described as converted to units of μc by the relationship 1 microcurie (μc) = 2.22×10^6 d/m; and recorded on Form NRDL-454 (Radioisotope Control/Sealed Source) Figure 4. This form is on a 4" x 6" file card, upon which an accurate running account is made, periodically, of the following data concerning each sealed source in the Laboratory's inventory: Isotope, identification number, original activity level and date of assay, percent activity level and date of calculation, condition of source, type of leak test made, source location, date of latest movement, custodian and date leak test performed. In addition, space is provided for remarks on the reverse side of the card for additional information concerning physical data or other characteristics of the source.

Sealed Beta Sources: Procedures previously cited are used for wiping sealed beta-gamma sources. For beta sources whose energy is fairly high (> 0.2 MEV) end-window G-M counting is the method used. For those sources of low energy (in the KeV region), liquid scintillation counting is available. Also available is a gas-flow proportional counting system capable of counting beta activities of the energy level of tritium.

Sealed Alpha Sources: Wiped with the types of filter paper material cited for sealed beta-gamma sources. The paper is moistened with alcohol or some other appropriate solvent and the test performed as described. The paper is then carefully dried and counted in a suitable counting system, such as under an alpha scintillation detector coupled to an appropriate electronic circuit. Results are calculated and recorded as for other types of radiations.

Special Cases: (a) In certain experimental set-ups in the Laboratory, a sealed source may be physically located in the equipment in such a way as to render very difficult, or impossible, the access for an actual test of the source capsule itself. In such cases, the test is made at the nearest accessible location to the source where there could be the remotest possibility of effluent contamination. This Laboratory especially adheres to this procedure where the source is used for fine calibration purposes, or when the radiation emitted from the source presents a major hazard, or (b) in certain cases sources are moved to the exposed position with a liquid, such as water. A test of the liquid is made for contamination which would be indicative of source leakage. At least 100 cubic centimeters (cc) of liquid are sampled, reduced in volume to a few cc by careful heating, and heated to near-dryness in a 2" stainless steel planchet. The glass beaker used for volume reduction is washed with acid and distilled water and this small volume is added to contents of the planchet. Contents are heated to dryness and the planchet is then counted in an appropriate counting system.

Determination of a Leaking Source: All sources made in the Laboratory or received from an outside manufacturer are wipe-tested by the Health Physics Division when received for use. If no removable contamination is detected, the records are so marked. Should removable contamination be detected during a subsequent test the source is automatically considered to be a "leaking source". However, should removable contamination be detected upon receipt of source, or immediately after manufacture, the source will be decontaminated, and then re-tested after a suitable storage period (usually seven days). If, after decontamination, test results indicate the further discharge of radioactive material from the capsule, the source is immediately withdrawn from use, placed in safe storage to

await reencapsulation, or disposed of as radioactive waste, with appropriate notification to governmental agencies, as required by 10 CFR 20, and U. S. Navy Regulations.

In the event of doubt whether a source is leaking or contaminated by some other radioisotope, the wipe sample is counted in a multichannel gamma analyzer in an attempt to identify the activity.

Beta-gamma sources are wiped every six months and alpha sources every three months. Sources that are not in active use (in storage) are not wiped on a routine basis but are wiped when either placing in storage or removing from storage.

9. Emergency Actions

In the event of a spill or other radioisotope release, priority action is given to containment or contamination and prevention of personnel exposures. Personnel decontamination, if required, is initiated immediately. As soon as possible, bioassay sampling and whole body counting is accomplished. Area decontamination and correction of the cause of incident follows.

To cope with fires, glove boxes are equipped with dry powder and/or liquid chemical fire extinguishers. In addition, CO_2 and H_2O fire extinguishers are conveniently located throughout NRDL buildings. Buildings are equipped with automatic sprinkler systems and fire hose stations. The Laboratory is evacuated in event of fire by public address system notification. Personnel required for duties associated with combating fire remain in the building. The local fire department of the San Francisco Bay Naval Shipyard has been provided with information as to Laboratory fire fighting problems. Familiarization fire drills are carried out on a periodic basis.

SUPPLEMENT 9 (Item 15)

Dry and liquid waste containers are provided in all laboratory spaces where by-product material is used or stored. (Figure 6 and 7). They are emptied routinely when 3/4 full or when monitoring surveys indicate they should be removed from the area. While no upper radiation level for removal of a waste container has been set, it is general policy to keep the levels as low as possible.

The wastes are removed to either of two fenced areas for treatment appropriate to the type of waste. Solid wastes are packaged for disposal in "Strong, Tight Crates" (Figure 8) with suitable shielding being incorporated to maintain radiation levels within the maximum permitted by D.O.T. regulations.

In addition, certain materials will require additional containers for disposal. Several types of special containers have been fabricated (Figure 9) and are designated as D.O.T. Type 2R containers for materials such as Strontium-90, etc.

Contaminated animal carcasses are disposed of by placing in standard 55 gallon drums. The carcasses are buried in a layer of inert sand and when the drums are filled, a cap of approximately 4 inches of concrete is used to seal the drum.

Liquid wastes are held for disposal in glass lined underground tanks located within another fenced area. Liquid waste containers, except those containing Tritium, are removed to the storage area and are neutralized to approximately pH 7 before being placed in the holding tanks.

Liquid wastes containing Tritium are solidified in the collection container (Figure 7) by the addition of an inert inorganic absorbent. The solidified wastes are then disposed as solid waste in the "Strong, Tight Crate" (Figure 8).

Ultimate disposal of all liquid and solid waste is to an A.E.C. licensed waste contractor. At present NRDL by-product material wastes are handled by Nuclear Engineering Company, Inc., P.O. Box 594, Walnut Creek, California.

In addition, occasionally certain non-routine disposal operations must be performed. These non-routine disposal operations will be handled on an individual case basis and will conform with all applicable rules and regulations.

Byproduct material wastes with physical half-lives of 90 days or less are disposed of by storage and decay in roped off and posted restricted areas.

RADIOISOTOPE USE APPROVAL
12ND NRDL-44 (Rev 3/65)

1. Prepare original and 2 complete copies, including any sketches, drawings, etc.
2. Forward all 3 copies, as provided.
3. Use Form 12ND NRDL-44A for variations from previously approved Form 12ND NRDL-44.
4. Form 12ND NRDL-44 should be re-submitted after a period of one year.

ROUTING	CODE	APPROVAL SIGNATURE	DATE
From			
To Radiological Safety Chairman, ~~Radioisotope~~ Committee	920		
Via Radiological Safety (1) Division ~~Radioisotope~~ Committeeman			
(2) Health Physics Division	730		

It is requested that approval be granted for the use and the manner of use for the following radioisotopes.

Radioisotopes	Chemical Form	Special Irradiation Service
Quantity (mc or gram)	Date Required	Activity Per Experiment
Location of Use	Zone Level	

AUTHORIZED USERS	
NAME	CODE

WASTE CONCENTRATIONS AND AMOUNTS
Gas
Liquid
Solids

Experimental Title or Brief Description

Proposed Procedure (Attach sketch or description of apparatus)

Radiological Safety Precautions to be Taken by the Investigator

Figure 1

MODIFICATION OF R `IONUCLIDE USE APPROVAL
12ND NRDL-44A (Rev. 8/68)

1. Use only when modifying original request, Form 12ND NRDL-44
2. Prepare original and 2 copies, including sketches, drawings, etc., if any.
3. After Branch Head has signed forward all copies to Code 730.

From (Branch Code)	Date	Investigator & Room No.	Previous Stub No. Reference

To	Via
Chairman, Radiological Safety Committee, Code ~~901~~ 920	Health Physics Division, Code 730

It is requested that the following modification of original 12ND NRDL-44 be approved:

Signature of Branch Head	Signature of Chairman, Radiological Safety Committee

Figure 2.

RADIOISOTOPE USE INVESTIGATION
12ND NRDL-76 (Rev 6/65)

Adequate Safety Precautions Being Taken in Experiment	☐ Yes	☐ No

Special Equipment Requirements and Comments

Signature of Health Physics Investigator	Date
Reviewed by Head, Health Physics Division	Date

Figure 3.

RADIOISOTOPE CONTROL/SEALED SOURCE
12ND NRDL-454 (Rev 9/65)

Isotope_____ NRDL Source No._____ Stub No._____

Quantity_____ Assay Date_____ Half-Life_____

Date Stub Processed_____ Date Mat'l Received_____

Supplier & Ident._____

Leak Test (Wipe)			Source Location		
Date	μc	Initial	Room	Date	Custodian

Figure 4.

RADIOISOTOPE CONTROL
12ND NRDL-455 (Rev 8/65)

Isotope_____ Quantity_____ Stube No. _____

Experimenters_____ Location_____

Date Stub Processed_____ Date Mat'l. Received_____

Assay Date_____ Chemical Form_____

Supplier and Lot No. _____

REMARKS_____

Figure 5.

Naval Radiological Defense Laboratory
San Francisco Bay Naval Shipyard
San Francisco, California 94135

730-506
AK/ALS:kmm
3 MAR 1969

AIRMAIL

Rec'd: 3/17/69 & fwd'd to AEC by 1st. End. Ser. 0516 59 of 19 Mar. 1969

From: Commanding Officer
To: Chief, Isotope Branch, Division of Materials Licensing, U. S. Atomic Energy Commission, Washington, D. C. 20545
Via: Commander, Naval Electronic Systems Command, (Code 05163), Munitions Building, Room 4713, Nucleonics Branch, 18th & Constitution Avenues, Washington, D. C. 20390

Subj: AEC Byproduct License No. 04-00487-03; request for renewal of

Encl: (1) Application for Byproduct Material License (Renewal) AEC Form-313, with enclosures

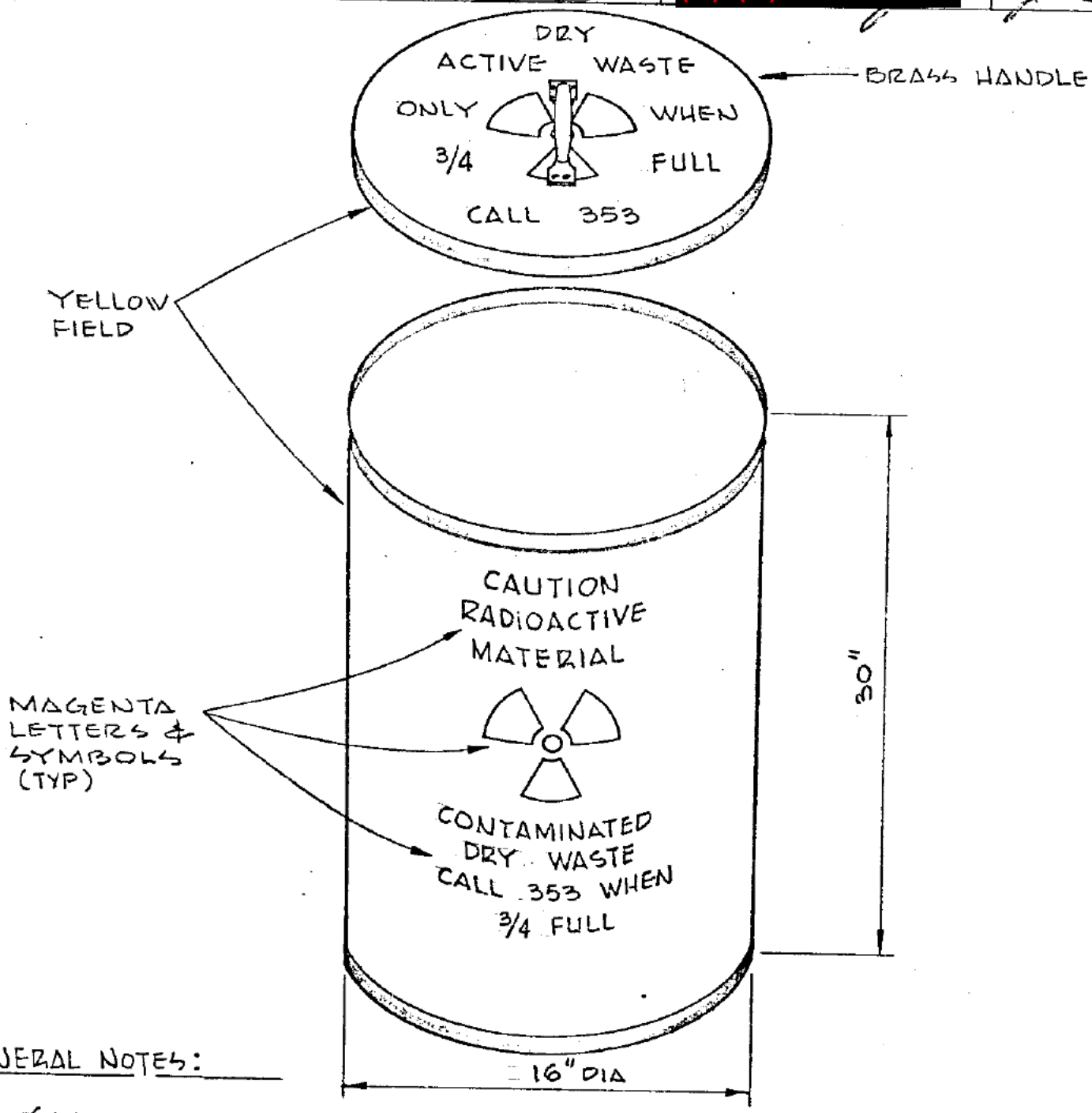
1. This Laboratory's application for renewal of Byproduct Material License 04-00487-03, enclosure (1), is submitted for review and approval. The material submitted in support of the application has been recently updated and represents current radioisotope needs and methods of utilization.

2. Any clarification or further information needed in support of this application will be supplied upon request.

(b) (6)

By direction

U.S. NAVAL RADIOLOGICAL DEFENSE LABORATORY SAN FRANCISCO 24, CALIFORNIA	SCALE ~	DATE 6-4-65	PROJECT NO.
TITLE SOLID RADWASTE CONTAINER	DRAWING NO. M-65-102		ALTERATION
DRAWN BY (b) (6)	CHECKED BY (b) (6)	APPROVED BY (b) (6)	SATISFACTORY TO (b) (6)	DATE 7 June 65



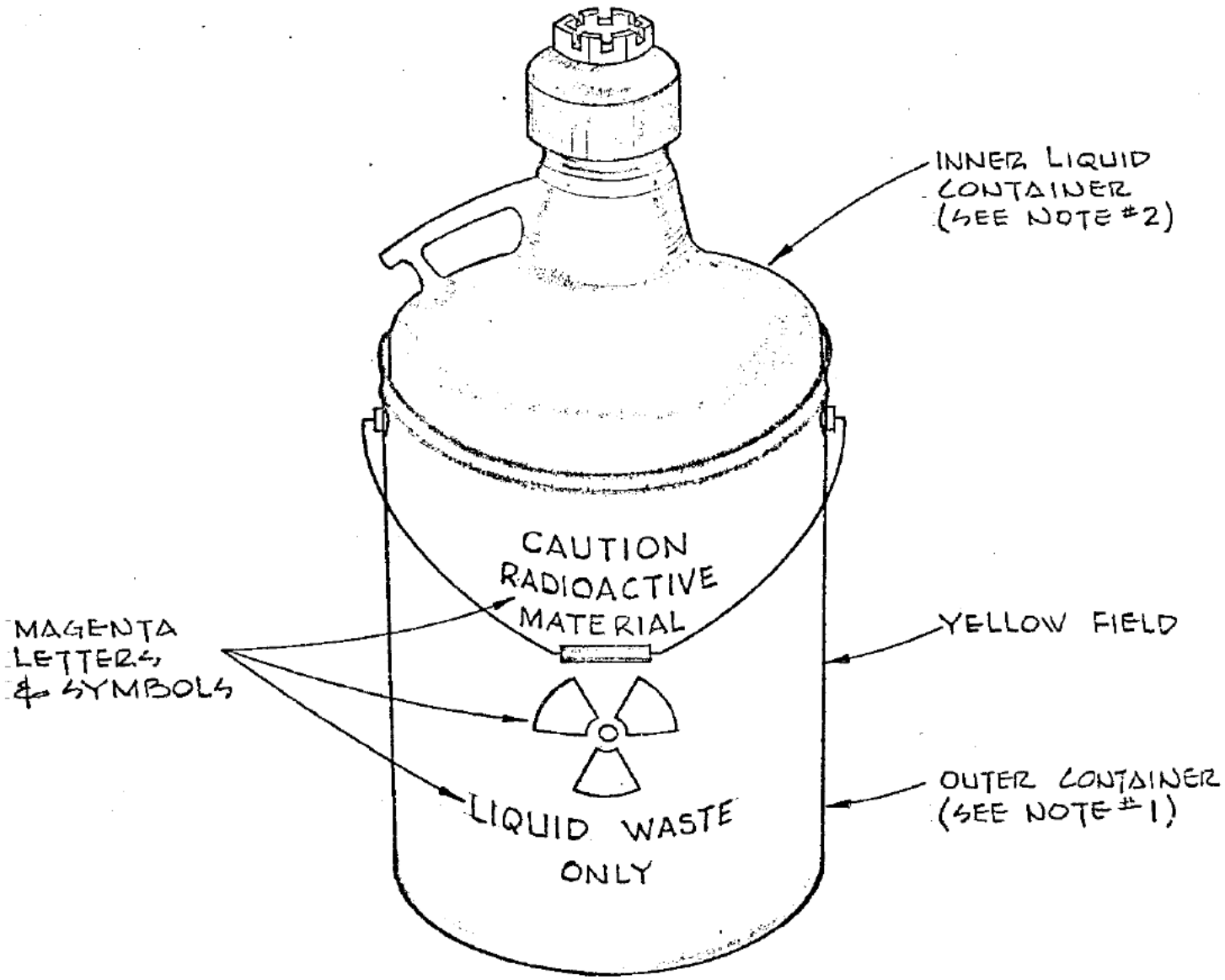
GENERAL NOTES:

1. CONTAINER MATERIAL: FIBER DRUM.
2. CONTAINER TO BE LINED WITH REMOVABLE POLYETHYLENE BAG.
3. RADIATION SYMBOL TO BE 4" DIA., ALL OTHER DIMENSIONS AS PER NRDL DWG. M-58-79. LETTERS TO BE $\frac{3}{4}$" HIGH MIN.
4. SAME DESIGN ON OPPOSITE SIDE & LID OF CONTAINER.
5. ALL DIMENSIONS ARE APPROXIMATE.

DRAWING SHEET 12ND NRDL 542 (2-58)

Figure 6

U.S. NAVAL RADIOLOGICAL DEFENSE LABORATORY SAN FRANCISCO 24, CALIFORNIA			SCALE ✓	DATE 6-2-65	PROJECT NO.
TITLE LIQUID RADWASTE CONTAINER			DRAWING NO. M-65-101		ALTERATION
DRAWN BY (b) (6)	CHECKED BY (b) (6)	APPROVED BY (b) (6)	SATISFACTORY TO (b) (6)		DATE 7 June 65



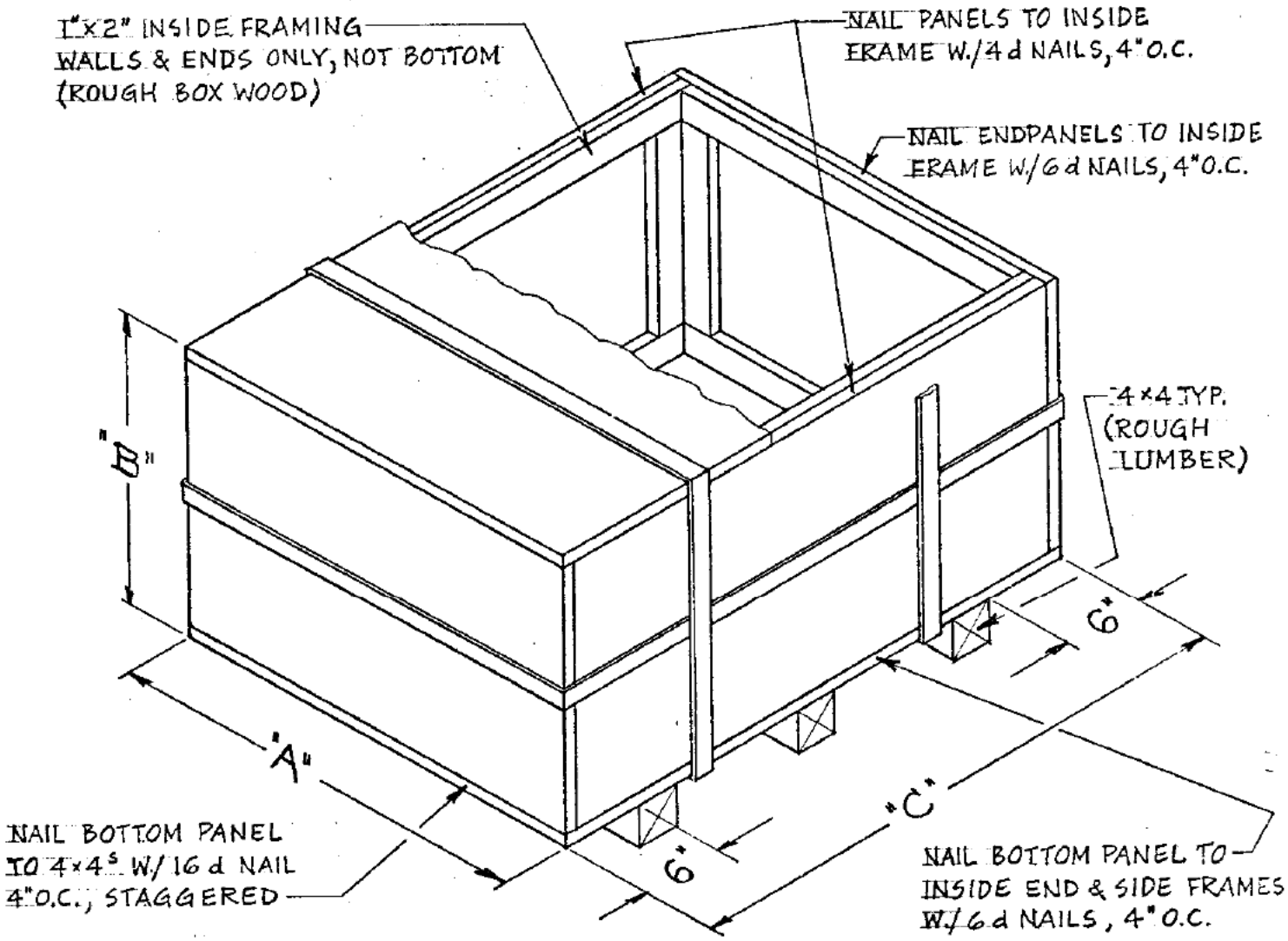
GENERAL NOTES

1. OUTER CONTAINER: 5 GALS (US) UNIVERSAL PAIL, ICC 37A, 24 GA.
2. INNER LIQUID CONTAINER: CARBOY, POLYETHYLENE, 5 GAL SIZE WITH HANDLE & SCREW CAP.
3. RADIATION SYMBOL TO BE 4" DIA., ALL OTHER DIMENSIONS AS PER NRDL DWG. M-58-79. LETTERS TO BE 3/4" HIGH MIN.
4. SAME DESIGN ON OPPOSITE SIDE OF CONTAINER.
5. ALL DIMENSIONS ARE APPROXIMATE.

DRAWING SHEET 12ND NRDL 542 (2-58)

Figure 7

U.S. NAVAL RAD. ICAL DEFENSE LABORATORY SAN FRANCISCO 24, CALIFORNIA			SCALE NONE	DATE 8-26-64	PROJECT NO.
TITLE RADWASTE DISPOSAL BOX			DRAWING NO. 246C-769		ALTERATION
DRAWN BY (b) (6)	CHECKED BY	APPROVED BY	SATISFACTORY TO		DATE



BOX SCHEDULE			
	"A"	"B"	"C"
TYPE I	44	24 5/8	91 1/2
TYPE II	44	24 5/8	96

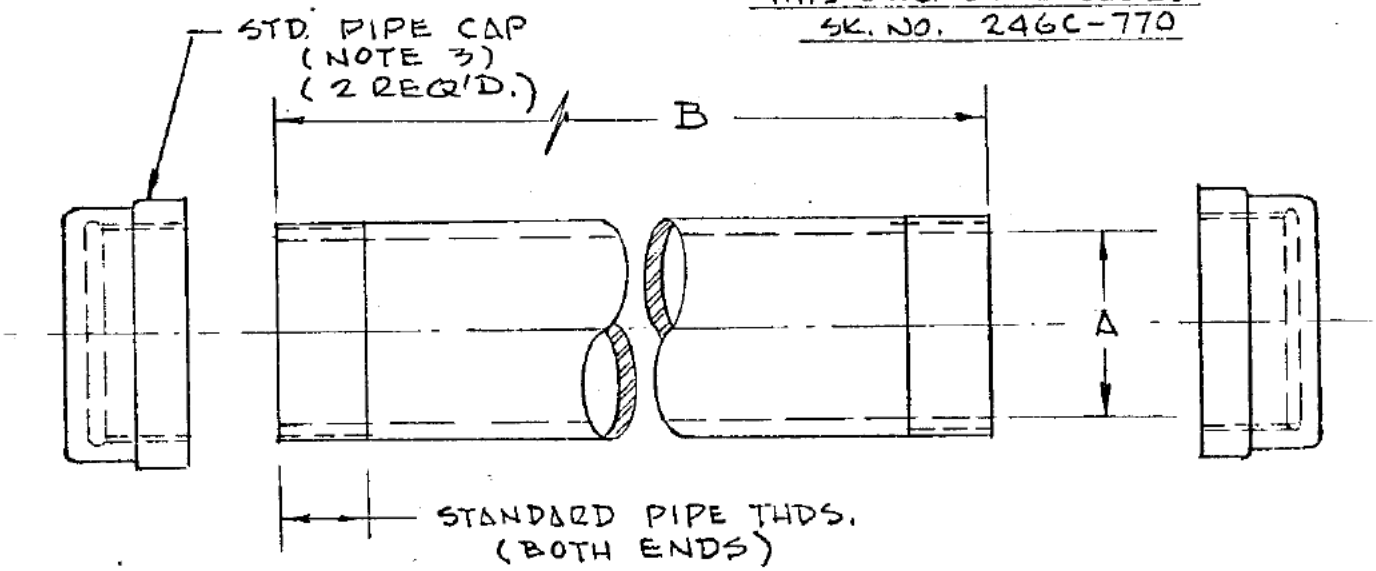
GENERAL NOTES:

1. MAKE BOX FROM 5/8" THICK PLYWOOD GRADE C-D INTERIOR UNSANDED.
2. USE CEMENT COATED NAILS.
3. INSTALL 3/4" WIDE STEEL BANDS AS SHOWN AFTER PACKING IS COMPLETED.

Figure 8

U.S. NAVAL RADIOLOGICAL DEFENSE LABORATORY SAN FRANCISCO 24, CALIFORNIA	SCALE NONE	DATE NOV. 30, '64	PROJECT NO.
TITLE (SPEC. 2R) RADWASTE CONTAINER	DRAWING NO. 246C-794		ALTERATION
DRAWN BY (b) (6) / CHECKED BY (b) (6) / APPROVED BY (b) (6)	SATISFACTORY TO		DATE

THIS DWG. SUPERSEDES SK. NO. 246C-770



PIPE SCHEDULE		
TYPE	DIM. "A" (I.P.S.)	DIM. "B"
1	2"	12"
2	3"	12"
3	4"	12"
4	6"	16"

NOTES:

1. CONTAINER TO MEET D.O.T. SPECIFICATION 2R.
2. ALL PIPES TO BE SCHED. 40 STD. WROUGHT STEEL.
3. ALL PIPE CAPS TO BE SCHED. 40 STD. MALLEABLE IRON.
4. APPLY WHITE LEAD TO THREADS AS REQUIRED FOR WATER TIGHT INTEGRITY.

Figure 9

U. S. NAVAL RADIOLOGICAL DEFENSE LABORATORY
SAN FRANCISCO, CALIFORNIA 94135

IN REPLY REFER TO:
730-502
AK:kmm

3 MAR 1969

Autochem Corporation
Seven Fairchild Court
Plainview, New York 11803

Gentlemen:

In reference to Contract N00039-68-C-3576, the Naval Radiological Defense Laboratory's (NRDL) AEC Special Nuclear Material License Number is SNM-35.

The license authorizes NRDL to receive and possess the Plutonium-239 contained in the two AN/UDM-7B, received by NRDL from your Corporation on 14 February 1969.

Sincerely yours,

(b) (6) [redacted]
Head, Health Physics Division

Copy to:
NAVELEX (Codes 05162 & 05163)
ACO, DCASD, Garden City

9900
Ser 23 - 0516
FEB 5 1969

FIRST ENDORSEMENT ON USNRDL LETTER SER 730-464 ALS:kmm OF 27 JAN 1969

From: Commander, Naval Electronic Systems Command
To: Chief, Isotopes Branch
Division of Materials Licensing
U. S. Atomic Energy Commission
Washington, D. C. 20545

Subj: Hot Cell Facilities At Camp Parks, Jurisdiction Over

1. Basic letter clarifies NRDL's (Naval Radiological Defense Laboratory's) responsibilities relevant to the proposed use of subject facilities in conjunction with SRI (Stanford Research Institute).

2. The Laboratory's letter includes present functions of hot cell custody and licensing responsibility with a scheduled transfer date of the functions to SRI.

3. The Atomic Energy Commission will be notified prior to any transfer of functions.

(b) (6) [redacted]
By direction

Copy to:
BUMED(Code 74)
NRDL, SFRAN

(b) (6) [redacted]
61457 = 2/4/69

U. S. NAVAL RADIOLOGICAL DEFENSE LABORATORY
SAN FRANCISCO, CALIFORNIA 94135

IN REPLY REFER TO:
730-464
ALS:kmm
27 JAN 1969

Rec'd on 1/3/69 & fwded to AEC as 1st End., ser. 0516 23 of 5 Feb. 1969

AIRMAIL

From: Commanding Officer
To: Chief, Isotope Branch, Division of Materials Licensing, Atomic Energy Commission
Via: Commander, Naval Electronic Systems Command, (Code 05163)

Subj: Camp Parks Hot Cell Facilities; use of in conjunction with Stanford Research Institute (SRI)

1. As requested by Mr. [redacted], DML, U.S. Atomic Energy Commission in a telephone conversation on 13 December 1968, with Mr. [redacted] of this Laboratory, the following information is submitted to clarify the responsibilities in the proposed use by NRDL and SRI of the Hot Cell Facilities at Camp Parks, Pleasanton, California.

2. It is planned now for NRDL to retain hot cell custody and licensing responsibility for all hot cell operations until 30 June 1969. At that time, NRDL hot cell operations will be transferred to the main Laboratory site at San Francisco and SRI will assume custody and licensing responsibility for the Camp Parks hot cell. Thus, there will be no dual control of the hot cell.

[redacted]