

## MATERIALS LICENSE

Amendment No. 46

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 36, 39, 40, and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations, and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

OFFICIAL RECORD COPY

## Licensee

1. National Aeronautics & Space Administration
2. Goddard Space Flight Center  
Health Physics, Code 205.9  
Greenbelt, Maryland 20771-0001

In accordance with the letter dated  
July 1, 1996,3. License Number 19-05748-02 is amended in  
its entirety to read as follows:

4. Expiration Date July 31, 2000

5. Docket or  
Reference No. 030-045386. Byproduct, Source, and/or  
Special Nuclear Material7. Chemical and/or Physical  
Form8. Maximum Amount that Licensee  
May Possess at Any One Time  
Under This License

- |   |                                     |  |
|---|-------------------------------------|--|
| A. Any byproduct material with Atomic Numbers 1 through 83  | A. Any                              | A. Not to exceed 10 millicuries per radionuclide and 500 millicuries total |
| B. Any byproduct material with Atomic Numbers 1 through 83  | B. Sealed sources                   | B. Not to exceed 1 curie per radionuclide and 50 curies total              |
| C. Any byproduct material with Atomic Numbers 1 through 83  | C. Plated or sealed sources         | C. Not to exceed 16 millicuries per radionuclide and 800 millicuries total |
| D. Any byproduct material with Atomic Numbers 84 through 96 | D. Any                              | D. Not to exceed 1 millicurie per radionuclide and 10 curies total         |
| E. Any byproduct material with Atomic Numbers 84 through 96 | E. Sealed or plated sources         | E. Not to exceed 100 millicuries per radionuclide and 1 curie total        |
| F. Hydrogen 3   | F. Any                              | F. 200 curies  |
| G. Iron 55  | G. Any                              | G. 5 curies  |
| H. Cobalt 60  | H. Sealed sources                   | H. 10 curies   |
| I. Nickel 63  | I. Any                              | I. 1 curie   |
| J. Krypton 85   | J. Any                              | J. 110 curies  |
| K. Iodine 125   | K. Sealed sources                   | K. 5 curies  |
| L. Cesium 137   | L. Sealed sources                   | L. 5 curies  |
| M. Promethium 147   | M. Any                              | M. 10 curies   |
| N. Polonium 210   | N. Any                              | N. 10 millicuries  |
| O. Polonium 210   | O. Sealed or plated sources         | O. 5 curies  |
| P. Americium 241  | P. Any                              | P. 10 millicuries  |
| Q. Americium 241  | Q. Sealed sources or plated sources | Q. 5 curies  |
| R. Curium 244   | R. Any                              | R. 10 millicuries  |

**MATERIALS LICENSE  
SUPPLEMENTARY SHEET**

License Number

19-05748-02

Docket or Reference Number

030-04538

Amendment No. 46

- |   |  |  |
|---|--|--|
| <p>6. Byproduct, source, and/or special nuclear material</p> <p>S. Curium 244<br/>T. Californium 252<br/>U. Uranium 235<br/>V. Plutonium 238<br/>W. Plutonium 239</p> | <p>7. Chemical and/or physical form</p> <p>S. Sealed or plated sources<br/>T. Sealed or plated sources<br/>U. Sealed or plated sources<br/>V. Sealed or plated sources<br/>W. Sealed or plated sources</p> | <p>8. Maximum amount that licensee may possess at any one time under this license</p> <p>S. 5 curies<br/>T. 16.2 millicuries<br/>U. 10 grams<br/>V. 50 milligrams<br/>W. 20 micrograms</p> |
|---|--|--|

9. Authorized use

A. through W. Research and development as defined in 10 CFR 30.4

**CONDITIONS**

10. Licensed material may be used only at the licensee's facilities located at the National Aeronautics & Space Administration, Goddard Space Flight Center, Greenbelt, Maryland except that sealed and plated sources may be used at temporary job sites of the licensee anywhere in the United States.
11. A. Licensed material shall be used by, or under the supervision of, individuals designated by the licensee's Radiation Safety Committee, Phillip J. Nessler, Jr., Chairman.
- B. The Radiation Safety Officer for this license is Theodore D. Simmons.
12. A. Sealed sources and detector cells containing licensed material shall be tested for leakage and/or contamination at intervals not to exceed six months or at such other intervals as are specified by the certificate of registration referred to in 10 CFR 32.210, not to exceed three years.
- B. Notwithstanding Paragraph A of this Condition, sealed sources designed to emit alpha particles shall be tested for leakage and/or contamination at intervals not to exceed three months.
- C. In the absence of a certificate from a transferor indicating that a leak test has been made within six months prior to the transfer, a sealed source or detector cell received from another person shall not be put into use until tested.
- D. Each sealed source fabricated by the licensee shall be inspected and tested for construction defects, leakage, and contamination prior to any use or transfer as a sealed source.
- E. Sealed sources and detector cells need not be leak tested if:
- (i) they contain only hydrogen-3; or
  - (ii) they contain only a radioactive gas; or

MATERIALS LICENSE  
SUPPLEMENTARY SHEET

License Number

19-05748-02

Docket or Reference Number

030-04538

Amendment No. 46

- |   |                                  |  |
|---|----------------------------------|--|
| 6. Byproduct, source, and/or special nuclear material | 7. Chemical and/or physical form | 8. Maximum amount that licensee may possess at any one time under this license |
| S. Curium 244   | S. Sealed or plated sources      | S. 5 curies  |
| T. Californium 252                                    | T. Sealed or plated sources      | T. 16.2 millicuries  |
| U. Uranium 235  | U. Sealed or plated sources      | U. 10 grams  |
| V. Plutonium 238                                      | V. Sealed or plated sources      | V. 50 milligrams   |
| W. Plutonium 239                                      | W. Sealed or plated sources      | W. 20 micrograms   |

## 9. Authorized use

- A. through W. Research and development as defined in 10 CFR 30.4

## CONDITIONS

10. Licensed material may be used only at the licensee's facilities located at the National Aeronautics & Space Administration, Goddard Space Flight Center, Greenbelt, Maryland except that sealed and plated sources may be used at temporary job sites of the licensee anywhere in the United States.
11. A. Licensed material shall be used by, or under the supervision of, individuals designated by the licensee's Radiation Safety Committee, Phillip J. Nessler, Jr., Chairman.
- B. The Radiation Safety Officer for this license is Theodore D. Simmons.
12. A. Sealed sources and detector cells containing licensed material shall be tested for leakage and/or contamination at intervals not to exceed six months or at such other intervals as are specified by the certificate of registration referred to in 10 CFR 32.210, not to exceed three years.
- B. Notwithstanding Paragraph A of this Condition, sealed sources designed to emit alpha particles shall be tested for leakage and/or contamination at intervals not to exceed three months.
- C. In the absence of a certificate from a transferor indicating that a leak test has been made within six months prior to the transfer, a sealed source or detector cell received from another person shall not be put into use until tested.
- D. Each sealed source fabricated by the licensee shall be inspected and tested for construction defects, leakage, and contamination prior to any use or transfer as a sealed source.
- E. Sealed sources and detector cells need not be leak tested if:
- (i) they contain only hydrogen-3; or
  - (ii) they contain only a radioactive gas; or

**MATERIALS LICENSE  
SUPPLEMENTARY SHEET**

License Number

19-05748-02

Docket or Reference Number

030-04538

Amendment No. 46

- (iii) the half-life of the isotope is 30 days or less; or
- (iv) they contain not more than 100 microcuries of beta and/or gamma emitting material or not more than 10 microcuries of alpha emitting material; or
- (v) they are not designed to emit alpha particles, are in storage, and are not being used. However, when they are removed from storage for use or transfer to another person, and have not been tested within the required leak test interval, they shall be tested before use or transfer. No sealed source or detector cell shall be stored for a period of more than 10 years without being tested for leakage and/or contamination.

F. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. If the test reveals the presence of 0.005 microcurie or more of removable contamination, a report shall be filed with the U.S. Nuclear Regulatory Commission and the source or detector cell shall be removed immediately from service and decontaminated, repaired, or disposed of in accordance with Commission regulations. The report shall be filed within five days of the date the leak test result is known with the U.S. Nuclear Regulatory Commission, Region I, ATTN: Chief, Nuclear Materials Safety Branch, 475 Allendale Road, King of Prussia, Pennsylvania 19406. The report shall specify the source or detector cell involved, the test results, and corrective action taken.

G. The licensee is authorized to collect leak test samples for analysis by the licensee. Alternatively, tests for leakage and/or contamination may be performed by persons specifically licensed by the Commission or an Agreement State to perform such services.

- 13. Sealed sources or detector cells containing licensed material shall not be opened or sources removed from source holders by the licensee.
- 14. The licensee shall not acquire licensed material in a sealed source or device unless the source or device has been registered with the U.S. Nuclear Regulatory Commission pursuant to 10 CFR 32.210 or equivalent regulations of an Agreement State.
- 15. Licensed material shall not be used in or on human beings.
- 16. The licensee shall not use licensed material in field applications where activity is released except as provided otherwise by specific condition of this license.
- 17. The licensee shall conduct a physical inventory every six months to account for all sealed sources and devices containing licensed material received and possessed under the license.
- 18. The licensee is authorized to transport licensed material in accordance with the provisions of 10 CFR Part 71, "Packaging and Transportation of Radioactive Material."

**MATERIALS LICENSE  
SUPPLEMENTARY SHEET**

License Number

19-05748-02

Docket or Reference Number

030-04538

Amendment No. 46

19. Radioactive waste generated shall be stored in accordance with the statements, representations, and procedures included with the waste storage plan described in the licensee's letter dated July 1, 1996.
20. Except as specifically provided otherwise in this license, the licensee shall conduct its program in accordance with the statements, representations, and procedures contained in the documents including any enclosures, listed below. The Nuclear Regulatory Commission's regulations shall govern unless the statements, representations and procedures in the licensee's application and correspondence are more restrictive than the regulations.
- A. Application dated August 24, 1989
  - B. Letter dated March 7, 1990
  - C. Application dated November 5, 1993
  - D. Letter dated July 1, 1996

AUG 19 1996

Date \_\_\_\_\_

For the U.S. Nuclear Regulatory Commission  
Original Signed By:  
Elizabeth Ullrich

By \_\_\_\_\_

Nuclear Materials Safety Branch  
Region I  
King of Prussia, Pennsylvania 19406



AUG 19 1996

Phillip J. Nessler, Jr.  
Chairman, Radiation Safety Committee  
National Aeronautics & Space Administration  
Goddard Space Flight Center  
Health Physics, Code 205.2  
Greenbelt, Maryland 20771-0001

Dear Mr. Nessler:

This refers to your license amendment request. Enclosed with this letter is the amended license. Please note that as part of this amendment, in accordance with 10 CFR 30.36, effective February 15, 1996, the expiration date of your license has been extended by a period of five years. Your new expiration date is stated in Item 4 of the license.

Please review the enclosed document carefully and be sure that you understand and fully implement all the conditions incorporated into the amended license. If there are any errors or questions, please notify the U.S. Nuclear Regulatory Commission, Region I Office, Licensing Assistance Team, (610) 337-5093 or 5239, so that we can provide appropriate corrections and answers.

Thank you for your cooperation.

Sincerely,

Original Signed By:  
Elizabeth Ullrich

Elizabeth Ullrich  
Division of Nuclear Materials Safety

License No. 19-05748-02  
Docket No. 030-04538  
Control No. 123398

Enclosure:  
Amendment No. 46

DOCUMENT NAME: R:\WPS\MLTR\L1905748.02

To receive a copy of this document, indicate in the box: "C" = Copy w/o attach/encl "E" = Copy w/ attach/encl "N" = No copy

OFFICE	DNMS/RI	N	DNMS/RI				
NAME	RGibson/rxg						
DATE	08/15/96	08/	/96	08/	/96	08/	/96

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ML 10

National Aeronautics and  
Space Administration

Goddard Space Flight Center  
Greenbelt, MD 20771



Reply to Attn of: 205.2

July 1, 1996

Licensing Assistant Section  
Nuclear Materials Safety Branch  
U.S. Nuclear Regulatory Commission, Region I  
475 Allendale Road  
King of Prussia, PA 19406-1415

SUBJECT: Request for Amendment to License Number 19-05748-02

Enclosed are two copies of our application for amendment to license number 19-05748-02. The amendments are necessary to bring our license package into compliance with current practices and regulatory requirements. This package is identical to that submitted for license renewal which was subsequently withdrawn when the Commission extended a one time automatic renewal of our license. If there are any questions please contact Mr. Theodore D. Simmons at 301-286-8482, I can be contacted at 301-286-4693.

A handwritten signature in cursive script, appearing to read "Phillip J. Nessler, Jr.".

Phillip J. Nessler, Jr.  
Chairman, Radiation Safety Committee

123398

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ML 10

JUL -3 1996

## APPLICATION FOR MATERIAL LICENSE

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 9 HOURS. SUBMITTAL OF THE APPLICATION IS NECESSARY TO DETERMINE THAT THE APPLICANT IS QUALIFIED AND THAT ADEQUATE PROCEDURES EXIST TO PROTECT THE PUBLIC HEALTH AND SAFETY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0120), OFFICE OF MANAGEMENT AND BUDGET WASHINGTON DC 20503.

INSTRUCTIONS: SEE THE APPROPRIATE LICENSE APPLICATION GUIDE FOR DETAILED INSTRUCTIONS FOR COMPLETING APPLICATION. SEND TWO COPIES OF THE ENTIRE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW. **030-04538**

## APPLICATION FOR DISTRIBUTION OF EXEMPT PRODUCTS FILE APPLICATIONS WITH:

DIVISION OF INDUSTRIAL AND MEDICAL NUCLEAR SAFETY  
OFFICE OF NUCLEAR MATERIALS SAFETY AND SAFEGUARDS  
U. S. NUCLEAR REGULATORY COMMISSION  
WASHINGTON, DC 20555-0001

## ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS:

## IF YOU ARE LOCATED IN:

CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, MAINE, MARYLAND,  
MASSACHUSETTS, NEW HAMPSHIRE, NEW JERSEY, NEW YORK, PENNSYLVANIA,  
RHODE ISLAND, OR VERMONT, SEND APPLICATIONS TO:

LICENSING ASSISTANT SECTION  
NUCLEAR MATERIALS SAFETY BRANCH  
U. S. NUCLEAR REGULATORY COMMISSION, REGION I  
475 ALLENDALE ROAD  
KING OF PRUSSIA, PA 19406-1415

ALABAMA, FLORIDA, GEORGIA, KENTUCKY, MISSISSIPPI, NORTH CAROLINA, PUERTO  
RICO, SOUTH CAROLINA, TENNESSEE, VIRGINIA, VIRGIN ISLANDS, OR WEST VIRGINIA,  
SEND APPLICATIONS TO:

NUCLEAR MATERIALS LICENSING SECTION  
U. S. NUCLEAR REGULATORY COMMISSION, REGION II  
101 MARIETTA STREET, NW, SUITE 2900  
ATLANTA, GA 30323-0199

## IF YOU ARE LOCATED IN:

ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR WISCONSIN,  
SEND APPLICATIONS TO:

MATERIALS LICENSING SECTION  
U. S. NUCLEAR REGULATORY COMMISSION, REGION III  
801 WARRENVILLE RD.  
LISLE, IL 60532-4351

ALASKA, ARIZONA, ARKANSAS, CALIFORNIA, COLORADO, HAWAII, IDAHO, KANSAS,  
LOUISIANA, MONTANA, NEBRASKA, NEVADA, NEW MEXICO, NORTH DAKOTA,  
OKLAHOMA, OREGON, PACIFIC TRUST TERRITORIES, SOUTH DAKOTA, TEXAS, UTAH,  
WASHINGTON, OR WYOMING, SEND APPLICATIONS TO:

NUCLEAR MATERIALS LICENSING SECTION  
U. S. NUCLEAR REGULATORY COMMISSION, REGION IV  
611 RYAN PLAZA DRIVE, SUITE 400  
ARLINGTON, TX 76011-8064

PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSED MATERIAL IN STATES SUBJECT TO U.S. NUCLEAR REGULATORY COMMISSION JURISDICTIONS.

## 1. THIS IS AN APPLICATION FOR (Check appropriate item)

☐  
☒  
☐

- A. NEW LICENSE  
B. AMENDMENT TO LICENSE NUMBER 19-05748-02  
C. RENEWAL OF LICENSE NUMBER \_\_\_\_\_

## 2. NAME AND MAILING ADDRESS OF APPLICANT (Include Zip code)

Theodore D. Simmons  
NASA Goddard Space Flight Center  
Health Physics, Code 205.9  
Greenbelt, Maryland 20771-0001

## 3. ADDRESS(ES) WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED

National Aeronautics and Space Administration  
Goddard Space Flight Center, Greenbelt, Maryland

and temporary job sites within the United States

## 4. NAME OF PERSON TO BE CONTACTED ABOUT THIS

Theodore D. Simmons  
Radiation Protection Officer

## TELEPHONE NUMBER

301-286-8482

SUBMIT ITEMS 5 THROUGH 11 ON 8-1/2 X 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.

## 5. RADIOACTIVE MATERIAL

- a. Element and mass number; b. chemical and/or physical form; and c. maximum amount which will be possessed at any one time

## 6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED

## 7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING EXPERIENCE

## 8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS

## 9. FACILITIES AND EQUIPMENT

## 10. RADIATION SAFETY PROGRAM

## 11. WASTE MANAGEMENT

## 12. LICENSEE FEES (See 10 CFR 170 and Section 170.31)

FEE CATEGORY Exempt AMOUNT 0.00  
ENCLOSED \$

## 13. CERTIFICATION (Must be completed by applicant) THE APPLICANT UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BINDING UPON THE APPLICANT.

THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT, NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PARTS 30, 32, 33, 34, 35, 36, 39 AND 40, AND THAT ALL INFORMATION CONTAINED HEREIN IS TRUE AND CORRECT TO THE BEST OF THEIR KNOWLEDGE AND BELIEF.

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.

CERTIFYING OFFICER - TYPED/PRINTED NAME AND TITLE Chairman,  
Phillip J. Nessler, Jr. Radiation Safety Committee

SIGNATURE

DATE

6/14/96

## FOR NRC USE ONLY

TYPE OF FEE	FEE LOG	FEE CATEGORY	AMOUNT RECEIVED	CHECK NUMBER	COMMENTS
			\$		

APPROVED BY

DATE

123398



**ITEM 5 - RADIOACTIVE MATERIAL.**

Unchanged. However, please remove Attachment I from NASA letter dated March 7, 1990 and insert updated Attachment I (included as pages 2-4 of this application).

**ITEM 6 - PURPOSES FOR WHICH LICENSED MATERIAL WILL BE USED.**

Unchanged.

**ITEM 7 - INDIVIDUALS RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING/EXPERIENCE.**

Unchanged.

**ITEM 8 - TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.**

Unchanged.

**ITEM 9 - FACILITIES AND EQUIPMENT.**

Remove Attachment D from NASA letter dated March 7, 1990 and insert updated Attachment D (included as Page 5 of this application). Change Item 14(b) of NASA letter dated March 7, 1990 to read: *"The equipment used to measure the activity is the Protean Instrument Model IPC-9025 and/or the Baird Model 989005 described in Attachment D."*

**ITEM 10 - RADIATION SAFETY PROGRAM.**

Remove and insert changed pages to our Ionizing Radiation Safety Handbook dated February 1989. Updated pages (included as attachments to Page 6 of this application) reflect references to Title 10 CFR §§ 20.1001-20.2401 which were incorporated on January 1, 1994.

Remove Attachment F from NASA letter dated March 7, 1990 and insert updated Attachment F (included as Page 7 of this application). This has been updated to comply with 10 CFR § 20.1906 and § 71.87.

Change Item 16, paragraph 2 of NASA letter dated March 7, 1990 to read: *"Dose rates with current source strength do not exceed 10 mR/hr at 1 (one) meter. Personal dosimeters for neutron detection are provided to users of Cf<sup>252</sup>."*

**ITEM 11 - WASTE MANAGEMENT.**

Remove Attachment G from NASA letter dated March 7, 1990 and insert updated Attachment G (included as Pages 8-11 of this application)

**Attachment I**  
to NASA letter dated March 7, 1990  
(Updated 6/7/95)

GSFC ID#	MANUFACTURER	MODEL/TYPE	SER #	DATE MFD	ACTIVITY (CI)
AM-241-528	IPL	PHI-241-1	AM-241-528	3-01-1990	1.00 E-03
AM-241-557	IPL	CUSTOM	V-054	1-01-1993	3.00 E-03
CD-109-135	IPL	PHI-109-1	CD-109-135	11-15-1989	1.00 E-03
CD-109-136	IPL	PHI-109-1	CD-109-136	3-01-1990	1.00 E-03
CD-109-137	IPL	CUSTOM	395-71	5-01-1992	3.00 E-03
CD-109-138	IPL	CUSTOM	V-083	12-01-1992	3.00 E-03
CD-109-139	IPL	CUSTOM	V-084	12-01-1992	3.00 E-03
CD-109-140	IPL	PHI-109-10	CD-109-140	5-01-1993	1.00 E-02
CD-109-141	IPL	PHI-109-10	CD-109-141	5-01-1993	1.00 E-02
CD-109-142	IPL	PHI-109-10	CD-109-142	5-01-1993	1.00 E-02
CD-109-143	IPL	PHI-109-10	CD-109-143	5-01-1993	1.00 E-02
CF-252-008	AMERSHAM	CVNQ4634	1440NC	5-28-1980	5.36 E-04
CF-252-010	AMERSHAM	CVN.7	5835NC	11-28-1994	3.00 E-03
CO-057-093	AMERSHAM	CTR27	3491MF	8-25-1987	2.95 E-03
CO-057-101	IPL	PHI-57-2	CO-057-101	11-15-1991	2.00 E-03
CO-060-003A	US NUCLEAR	338	*****	10-01-1964	6.40 E-02
CO-060-007	TRACERLAB	*****	*****	12-01-1961	5.00 E-05
CO-060-008	TRACERLAB	*****	*****	12-01-1961	5.00 E-04
CO-060-009	TRACERLAB	*****	*****	12-28-1961	1.00 E-03
CO-060-010	TRACERLAB	*****	*****	12-28-1961	1.00 E-03
CO-060-011	TRACERLAB	*****	*****	12-02-1961	1.00 E-03
CO-060-013	TRACERLAB	*****	*****	12-01-1961	1.00 E-03
CO-060-014	TRACERLAB	*****	*****	12-28-1961	1.00 E-03
CO-060-016A	US NUCLEAR	338	*****	4-03-1964	1.00 E-03
CO-060-018	TRACERLAB	*****	*****	7-06-1962	1.00 E-04
CO-060-019	TRACERLAB	*****	*****	7-06-1962	1.00 E-04
CO-060-020	TRACERLAB	*****	*****	7-01-1962	1.00 E-04
CO-060-021	TRACERLAB	*****	*****	7-01-1962	1.00 E-04
CO-060-022	TRACERLAB	*****	*****	7-01-1962	1.00 E-04
CO-060-023	TRACERLAB	*****	*****	7-01-1962	1.00 E-04
CO-060-024	TRACERLAB	*****	*****	7-01-1962	1.00 E-04
CO-060-025	TRACERLAB	*****	*****	7-01-1962	1.00 E-04
CO-060-026	TRACERLAB	*****	*****	7-01-1962	1.00 E-04
CO-060-027	TRACERLAB	*****	*****	7-01-1962	1.00 E-04
CO-060-028	US NUCLEAR	*****	*****	2-09-1962	1.50 E-02
CO-060-030A	US NUCLEAR	*****	*****	10-01-1964	2.00 E-01
CO-060-037	TRACERLAB	*****	*****	7-09-1963	5.00 E-05
CO-060-038	TRACERLAB	*****	*****	7-09-1963	5.00 E-05
CO-060-039	TRACERLAB	*****	*****	7-23-1963	5.00 E-05
CO-060-040	TRACERLAB	*****	*****	7-23-1963	5.00 E-05
CO-060-041	TRACERLAB	*****	*****	7-23-1963	5.00 E-05
CO-060-042	TRACERLAB	*****	*****	7-23-1963	5.00 E-05
CO-060-043	TRACERLAB	*****	*****	7-01-1963	1.00 E-04
CO-060-044	TRACERLAB	*****	*****	7-01-1963	1.00 E-04
CO-060-045	TRACERLAB	*****	*****	7-01-1963	1.00 E-04
CO-060-046	TRACERLAB	*****	*****	7-01-1963	1.00 E-04
CO-060-047	TRACERLAB	*****	*****	7-01-1963	1.00 E-04
CO-060-048	TRACERLAB	*****	*****	7-01-1963	5.00 E-04
CO-060-049	TRACERLAB	*****	*****	7-01-1963	5.00 E-04
CO-060-050	TRACERLAB	*****	*****	7-01-1963	5.00 E-04
CO-060-051	TRACERLAB	*****	*****	7-01-1963	5.00 E-04
CO-060-052	TRACERLAB	*****	*****	7-01-1963	5.00 E-04
CO-060-059	TRACERLAB	*****	*****	12-17-1963	1.00 E-03
CO-060-060	TRACERLAB	*****	*****	12-17-1963	1.00 E-03
CO-060-061	TRACERLAB	*****	*****	12-17-1963	1.00 E-03
CO-060-062	TRACERLAB	*****	*****	12-17-1963	1.00 E-03
CO-060-063	TRACERLAB	*****	*****	12-17-1963	1.00 E-03
CO-060-064	TRACERLAB	*****	*****	12-17-1963	1.00 E-03
CO-060-065	TRACERLAB	*****	*****	12-17-1963	1.00 E-03
CO-060-066	TRACERLAB	*****	*****	12-17-1963	1.00 E-03
CO-060-067	TRACERLAB	*****	*****	12-17-1963	1.00 E-03
CO-060-072	US NUCLEAR	338	*****	4-03-1964	1.00 E-03

GSFC ID#	MANUFACTURER	MODEL/TYPE	SER #	DATE MTD	ACTIVITY (CI)
CO-060-077	US NUCLEAR	38W	*****	4-03-1964	5.00 E-03
CO-060-090	TRACERLAB	R31	*****	4-01-1965	1.00 E-04
CO-060-091	TRACERLAB	R31	*****	4-01-1965	1.00 E-04
CO-060-092	TRACERLAB	R31	*****	4-01-1965	1.00 E-04
CO-060-099	NUCLEAR CHICAGO	*****	D-4	6-29-1965	1.02 E-04
CO-060-104	TRACERLAB	R31	*****	1-22-1966	5.00 E-04
CO-060-105	TRACERLAB	R31	*****	1-22-1966	5.00 E-04
CO-060-106	TRACERLAB	R31	*****	1-22-1966	5.00 E-04
CO-060-108	NUCLEAR CHICAGO	*****	*****	12-06-1965	2.35 E-04
CO-060-109	NUCLEAR CHICAGO	*****	*****	12-06-1965	2.24 E-04
CO-060-110	NUCLEAR CHICAGO	*****	*****	6-29-1965	1.08 E-04
CO-060-114	NUCLEAR CHICAGO	*****	C-90	3-15-1966	1.00 E-04
CO-060-117	TRACERLAB	R31M	*****	3-15-1966	1.00 E-04
CO-060-118	TRACERLAB	R31M	*****	7-13-1966	1.45 E-02
CO-060-125	TECH OPS (FICKER)	571	*****	3-01-1970	2.00 E-04
CO-060-201	NUCLEAR CHICAGO	*****	*****	3-01-1970	2.00 E-04
CO-060-202	NUCLEAR CHICAGO	*****	*****	3-01-1970	2.00 E-04
CO-060-204	NUCLEAR CHICAGO	*****	*****	8-01-1975	5.00 E-04
CO-060-205	NUCLEAR CHICAGO	*****	*****	4-01-1989	1.10 E-04
CO-060-232	IPL	GF-060R	230-82-1	9-01-1961	5.00 E-05
CO-060-248	IPL	*****	8	1-25-1961	5.00 E-05
CS-137-006	TRACERLAB	*****	*****	1-01-1968	2.00 E-01
CS-137-007	TRACERLAB	*****	*****	7-01-1963	7.50 E-05
CS-137-010	US NUCLEAR	*****	*****	7-01-1963	5.00 E-05
CS-137-014	TRACERLAB	*****	*****	7-01-1963	5.00 E-05
CS-137-019	TRACERLAB	*****	*****	7-01-1963	5.00 E-05
CS-137-020	TRACERLAB	*****	*****	7-01-1963	5.00 E-05
CS-137-021	TRACERLAB	*****	*****	7-01-1963	5.00 E-05
CS-137-022	TRACERLAB	*****	*****	7-01-1963	5.00 E-05
CS-137-023	TRACERLAB	*****	*****	7-01-1963	5.00 E-05
CS-137-024	TRACERLAB	*****	*****	7-01-1963	1.00 E-04
CS-137-025	TRACERLAB	*****	*****	7-01-1963	1.00 E-04
CS-137-027	TRACERLAB	*****	*****	7-01-1963	1.00 E-04
CS-137-028	TRACERLAB	*****	*****	7-01-1963	1.00 E-04
CS-137-029	TRACERLAB	*****	*****	7-01-1963	5.00 E-04
CS-137-031	TRACERLAB	*****	*****	7-01-1963	5.00 E-04
CS-137-032	TRACERLAB	*****	*****	7-01-1963	5.00 E-04
CS-137-033	TRACERLAB	*****	*****	7-01-1963	5.00 E-04
CS-137-083	US NUCLEAR	CCSD-2E	*****	7-01-1970	2.00 E-00
CS-137-101	VICTOREEN	848-8	*****	12-01-1974	1.00 E-01
CS-137-116	AMERSHAM	773	*****	6-29-1989	1.49 E-01
FE-055-323	AMERSHAM/SEARLE	*****	*****	8-14-1971	1.50 E-02
FE-055-518	IPL	*****	*****	4-01-1975	2.00 E-02
FE-055-529	IPL	*****	*****	8-01-1975	6.00 E-02
FE-055-530	IPL	*****	*****	8-01-1975	6.00 E-02
FE-055-531	IPL	*****	*****	8-01-1975	6.00 E-02
FE-055-532	IPL	*****	*****	8-01-1975	6.00 E-02
FE-055-533	IPL	*****	*****	8-01-1975	6.00 E-02
FE-055-534	IPL	*****	*****	8-01-1975	6.00 E-02
FE-055-571	IPL	*****	*****	7-13-1993	1.00 E-02
FE-055-613	IPL	PHR-055-5	*****	1-15-1988	5.00 E-03
FE-055-614	IPL	PHR-055-10	*****	6-01-1990	5.00 E-02
FE-055-621	IPL	PHI-55-50	M-162	10-01-1992	5.00 E-02
FE-055-624	IPL	PHI-55-50	U-344	10-01-1992	5.00 E-02
FE-055-625	IPL	PHI-55-50	U-345	10-01-1992	5.00 E-02
FE-055-626	IPL	PHI-55-50	U-346	10-01-1992	5.00 E-02
FE-055-627	IPL	PHI-55-50	U-347	10-01-1992	5.00 E-02
FE-055-628	IPL	PHI-55-50	U-729	10-01-1992	5.00 E-02
FE-055-629	IPL	CUSTOM	V-086	10-08-1992	5.00 E-03
GE-068-001	IPL	CUSTOM	V-085	10-04-1992	1.50 E-02
I-125-015	IPL	CUSTOM	V-085	10-04-1992	1.00 E-02
KR-085-034	AMERSHAM	X.163	004CEX	9-03-1991	1.00 E-02
PU-236-006N	LAB DE METROLOGIE	PU-N20	ERE/710	12-09-1992	5.16 E-04
SR-090-063	IONISANTS, FRANCE	*****	*****	4-10-1964	3.00 E-06
SR-090-064	UNIV OF CHICAGO	*****	*****	4-10-1964	3.00 E-06
SR-090-065	UNIV OF CHICAGO	*****	*****	4-10-1964	3.00 E-06

GSFC ID#	MANUFACTURER	MODEL/TYPE	SER #	DATE MFD	ACTIVITY (CI)
SR-090-066	UNIV OF CHICAGO	*****	*****	4-10-1964	3.00 E-06
SR-090-067	UNIV OF CHICAGO	*****	*****	4-10-1964	3.00 E-06
SR-090-089	US RADIUM CORP	*****	53704	12-01-1964	1.00 E-03
SR-090-090	US RADIUM CORP	*****	53705	12-01-1964	1.00 E-03
SR-090-242	IPL	BFI-090-1M	DD-114	4-01-1995	1.00 E-03
TL-204-022	MONSANTO RES CORP	MRC-TL-54	*****	5-16-1967	9.15 E-01
TL-204-023	MONSANTO RES CORP	MRC-TL-55	*****	5-16-1967	6.66 E-01
TL-204-024	MONSANTO RES CORP	MRC-TL-56	*****	2-10-1967	4.16 E-01

ATTACHMENT D  
to NASA letter dated March 7, 1990  
(Updated 6/7/95)

IONIZING RADIATION DETECTION INSTRUMENTS

MANUFACTURER	MODEL	P R O B E	Q T Y	DETECTABLE RADIATION	SENSIT. MIN-MAX	WINDOW THICK- NESS (mg/cm <sup>2</sup> )	U S E	HOW CALIB	FREQ CALIB
Protean	IPC-9025	-	1	a, B	1-1x10 <sup>6</sup> cpm	1.0	A	I	Daily*
Baird	989005	-	1	a, B, G	1-1x10 <sup>6</sup> cpm	N/A	A	I	Wkly*
Baird-Atomic	441A	GM	2	B, G	10-10000cpm	30	M	I	Daily*
Eberline	RM-3A	AC3	1	a	1-5x10 <sup>4</sup> cpm	1.0	M	I	Daily*
Eberline	RM-3A	GM	2	B, G	1-5x10 <sup>4</sup> cpm	30	M	I	Daily*
Packard	2002	-	1	B, G	1-9x10 <sup>5</sup> cnt	N/A	A	I	Daily*
Tracr-Nrthn	7200MCA	-	1	G (2048ch)	>10 KeV gamma	N/A	A	I	Daily*
Eberline	PNR-4	-	1	n	.5-5K mRem/hr	N/A	S, M	C	Annual
Victoreen	488A	-	1	h	1-12K nvth	N/A	S, M	C	Annual
Eberline	PAC4G	AC3	1	a	0-5x10 <sup>5</sup> cpm	0.85	S, M	I	Annual
Eberline	ESP-1	AC3-7	1	a	0-1x10 <sup>6</sup> cpm	0.85	S, A	I	Annual*
"	"	HP-270	1	B, G	.01-2K mR/hr	30	S, M	I	Annual
"	"	SPA-3	1	G	0-4x10 <sup>6</sup> cpm	N/A	S, M	I	Annual
"	"	LEG-1	1	G (low KeV)	0-4x10 <sup>6</sup> cpm	75.4	S, M	I	Annual
"	"	HP-260	1	B, G	0-2K mR/hr	2.0	S, M	I	Annual*
"	"	HP-290	1	G	0-50 R/hr	90	S, M	I	Annual
Victoreen	666	-	1	X, G	1-3x10 <sup>7</sup> mR/hr	220	S, M	C	Annual
Victoreen	541A	-	6	X, G	1-200 mR	N/A	D	I	Annual*
Victoreen	570	188	1	X, G	0.-0.025 R	220	D	C	Annual
"	"	633	1	X, G	0-2.5 R	220	D	C	Annual
"	"	70-5	1	X, G	0-25 R	67	D	C	Annual
"	"	154	1	X, G	0-250 R	89	D	C	Annual
"	"	651	1	low KeV X	0-250 R	7	D	C	Annual
Eberline	E500B	GM	1	B, G	.01-2K mR/hr	30	S, M	I	Annual
Eberline	E510	GM	4	B, G	.01-200mR/hr	30	S, M	I	Annual
Eberline	E520	GM	6	B, G	.01-2K mR/hr	30	S, M	I	Annual
Eberline	E530	GM	2	B, G	.01-200mR/hr	30	S, M	I	Annual
Victoreen	471RF	-	1	G	.1-3x10 <sup>5</sup> mR/hr	18.1	S	I	Annual
Johnson	GS-4-5	GM	1	B, G	.01-20 mR/hr	30	S, M	I	Annual
Eberline	RO-20	-	1	X, G	0.1-50000 mR/hr	7	S	I	Annual
Eberline	RO-3C	-	1	X, G	1-5000 mR/hr	3.5	S	I	Annual

Note Codes: S=Surveying; M=Monitoring; A=Assaying; D=Dosimetry; I=Inhouse  
C=Contracted (certified facility); \*=prior to use  
All sources used for calibration are N.I.S.T. traceable.



**IONIZING RADIATION HANDBOOK  
(GHB 1860.1B)  
Updated Page Changes**

THE FOLLOWING PAGES (NUMBERED 21-32) ARE CHANGES TO THE  
GODDARD HANDBOOK 1860.1B.

REMOVE OUTDATED PAGES AND INSERT NEW PAGES DATED JANUARY 1, 1994.

## 3.2 Radiation Protection Guidelines

### 3.2.1 Exposure Limits for Adult Radiation Workers'

3.2.1.1 Limits<sup>not</sup> for Exposure to External Radiation shall exceed the limits specified in 10 CFR 20, Subpart C:

Rems (Sieverts)/calendar year

Total Effective Dose Equivalent, or 5.0 (0.05)

Sum of the deep-dose equivalent and committed dose equivalent or extremity shallow dose equivalent 50.0 (0.5)

Eye dose equivalent 15.0 (0.15)

3.2.1.2 Limits for Airborne Concentrations of Radioactive Materials - Guidelines in 10 CFR 20, Subpart H will be followed to limit internal exposure in restricted areas.

3.2.1.3 Limits for Skin Contamination - The table below lists permissible limits for skin contamination. If these levels are thought to be exceeded, the HS&SO must be notified.

MAXIMUM PERMISSIBLE CONTAMINATION LEVELS				
Location	Alpha (dpm/100cm <sup>2</sup> )	Beta-Gamma measured at 1 cm		Transferrable (Smear) Alpha/Beta/Gamma
		mRem/hr	microsieverts/hr	
Body	150	<0.06	<0.6	None Detectable
Hands	150	<0.10	<1.0	None Detectable

3.2.2 Exposure Limits For Non-radiation Workers: Limits for individual members of the public shall not exceed the limits specified in 10 CFR 20, Subpart D.

### 3.2.3 Radiation Control Areas

- 3.2.3.1 Radioactive Materials Area - Each area or room in which radioactive material is used or stored in quantities specified in 10 CFR 20.1902(e) is designated a "Radioactive Materials Area."
- 3.2.3.2 Radiation Area - Areas accessible to individuals in which radiation levels could result in an individual receiving a dose equivalent in excess of 5.0 millirem (0.05 mSv) in 1 hour at 30 centimeters from the radiation source or from any surface that the radiation penetrates.
- 3.2.3.3 High Radiation Area - Areas accessible to individuals in which radiation levels could result in an individual receiving a dose equivalent in excess of 100 millirem (1 mSv) in 1 hour at 30 centimeters from the radiation source or from any surface that the radiation penetrates.
- 3.2.3.4 Airborne Radioactivity Area - The concentration of airborne radioactive material in any occupied radiation control area may not exceed the amount specified in 10 CFR 20, Appendix B, Table 1. The concentration of airborne radioactive material in any unoccupied radiation control area (e.g., a glove box) is limited only by radiation caused by such airborne activity outside of that area.
- 3.2.3.5 Contaminated Area - The table below lists the surface contamination limits for radiation control areas.

# Permissible Contamination Limits

Control Classification	Removable Contamination Limits (dpm/100 cm <sup>2</sup> )		Minimum Control Required
	Alpha	Beta-Gamma	
Clean	<20	<200	None
Contaminated	>20 <1,000	>200 <10,000	Lab Coat and gloves required. Personnel may leave the area and equipment may be re- moved only after moni- toring shows them to be clean. Radiation control sign will indicate that the area is contaminated and list the requirements for entry.
	>999 <9,999	>10,000 <100,000	Coveralls, gloves, and shoe covers are re- quired. Personnel may leave area only after monitoring shows them to be clean. Equip- ment may be removed from area only after monitoring by the HS&SO. Radiation control area signs will indicate area is contaminated and list requirements for entry.
	>9,999	>100,000	Requires specific operating procedures approved by the RSC.

\*\*\*\*\* NOTE: ALL OPERATIONS SHALL FOLLOW ALARA! \*\*\*\*\*

January 1, 1994 (Change 1)

### 3.2.4 Unrestricted Area Limits

Areas not classified as radiation control areas are considered to be unrestricted areas.

3.2.4.1 External Radiation Limits - External radiation levels must not exceed 20 microsieverts/hr (2 mRem/hr) or exceed a general public dose limit of 1 millisievert (100 mRem) in a year.

3.2.4.2 Airborne Contamination Limits - In unrestricted areas, concentrations of radioactive airborne materials may not exceed the limits specified in 10 CFR 20, Appendix B, Table 1 except as amended by license.

3.2.4.3 Surface Contamination Limits - In unrestricted areas, surface contamination is limited to the level listed under the clean area classification in Section 3.2.3.5.

3.2.5 Sealed Source Leakage/Contamination Limits - The table below lists the sealed source leakage/contamination limits.

SEALED SOURCE LEAKAGE LIMITS				
Restriction of Use	Maximum Amount of Leakage or Removable Contamination			
	Alpha		Beta-Gamma	
	microcuries	becquerels	microcuries	becquerels
None	$<1 \times 10^{-5}$	$<0.37$	$<1 \times 10^{-4}$	$<3.7$
Conditional use (i.e., use of enclosure and strict contamination controls)	$\geq 1 \times 10^{-5}$ $<5 \times 10^{-3}$	$\geq 0.37$ $<185$	$\geq 1 \times 10^{-4}$ $<5 \times 10^{-3}$	$\geq 3.7$ $<185$
Disposal as radioactive waste or return to manufacturer	$\geq 5 \times 10^{-3}$	$\geq 185$	$\geq 5 \times 10^{-3}$	$\geq 185$

January 1, 1994 (Change 1)

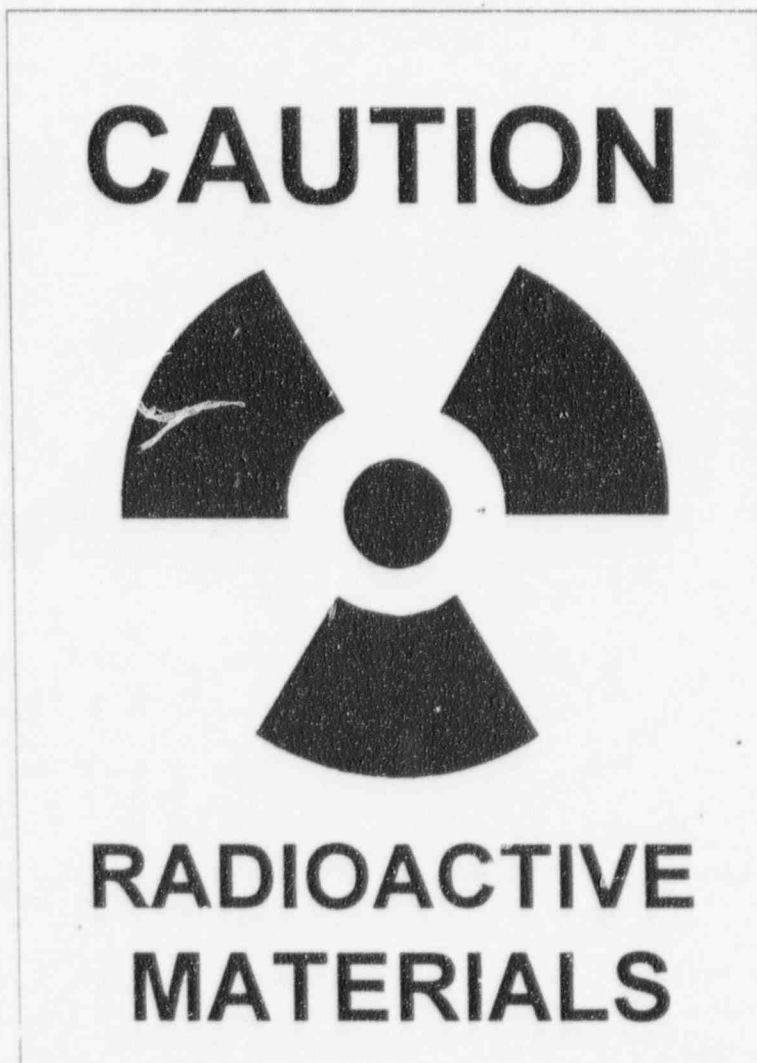


### 3.2.6

### Signs and Labels for Radiation Control Areas

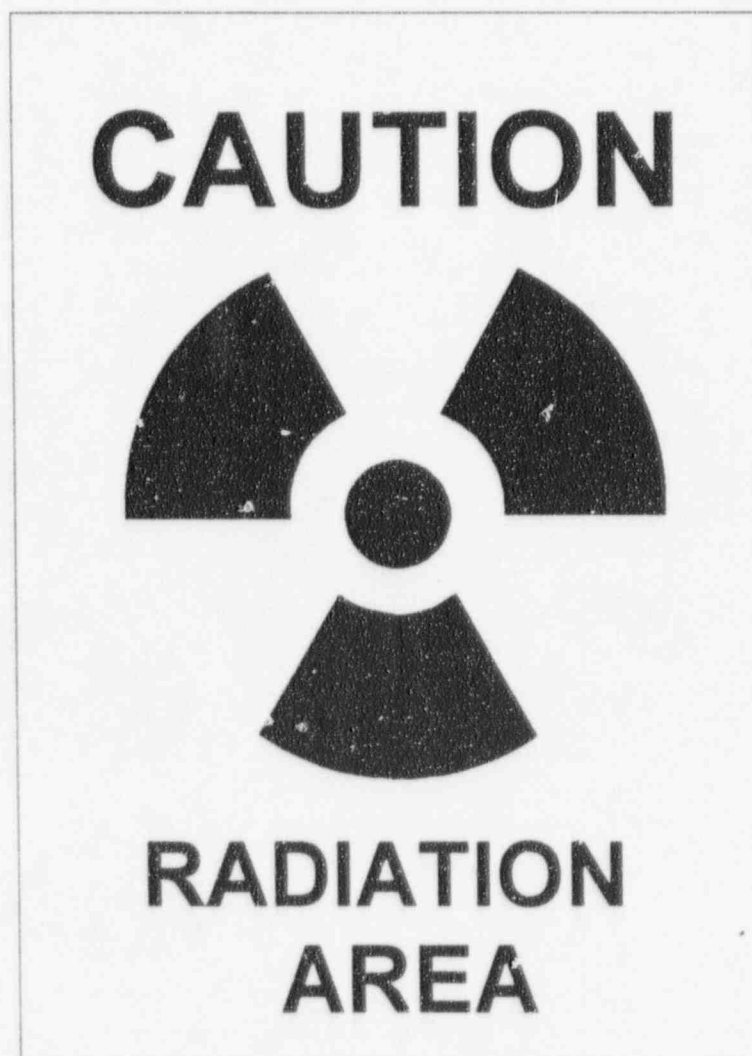
Standard magenta and yellow signs bearing the radiation symbol and an appropriate legend will be placed in the following potential hazard areas (waivers in particular cases may be granted by the HS&SO).

- 3.2.6.1 Radioactive Materials Area -  
The following sign must be posted in each area or room where used or stored radioactive material is ten times greater or its equivalent than the amount exempted in Appendix C of 10 CFR 20:



January 1, 1994 (Change 1)

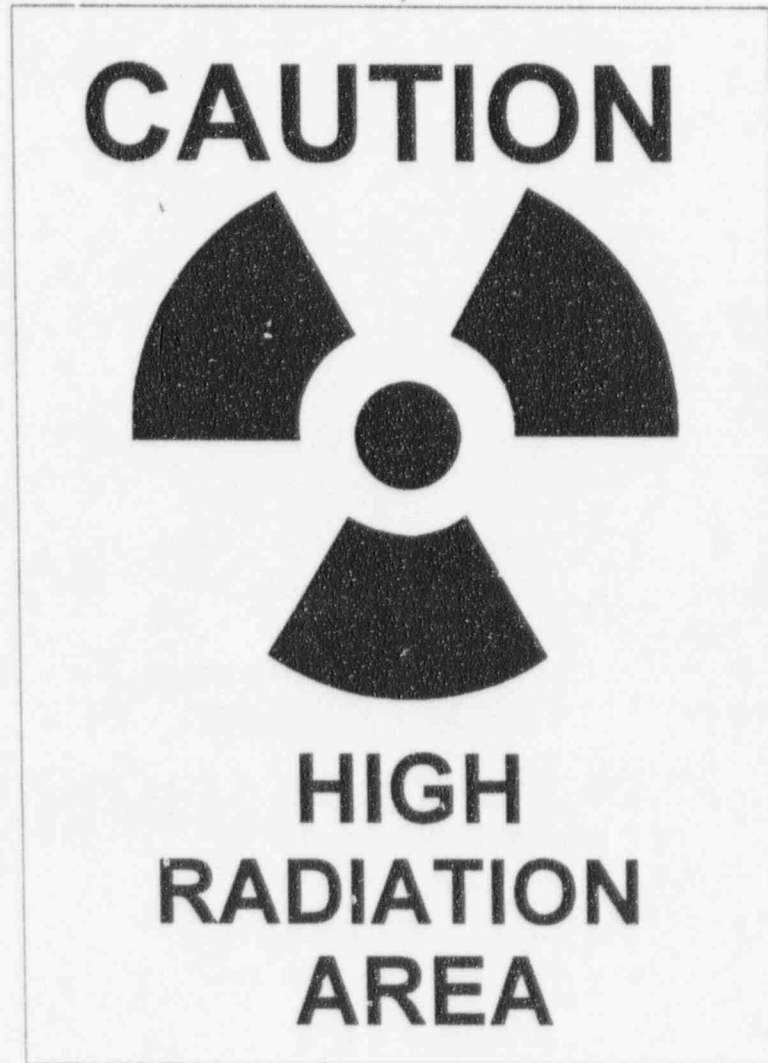
3.2.6.2. Radiation Area - The following sign must be posted in areas where radiation levels are high enough to result in an individual receiving a dose equivalent in excess of 5 millirem (0.05 mSv) in 1 hour at 30 centimeters from the radiation source or from any surface that the radiation penetrates.



January 1, 1994 (Change 1)

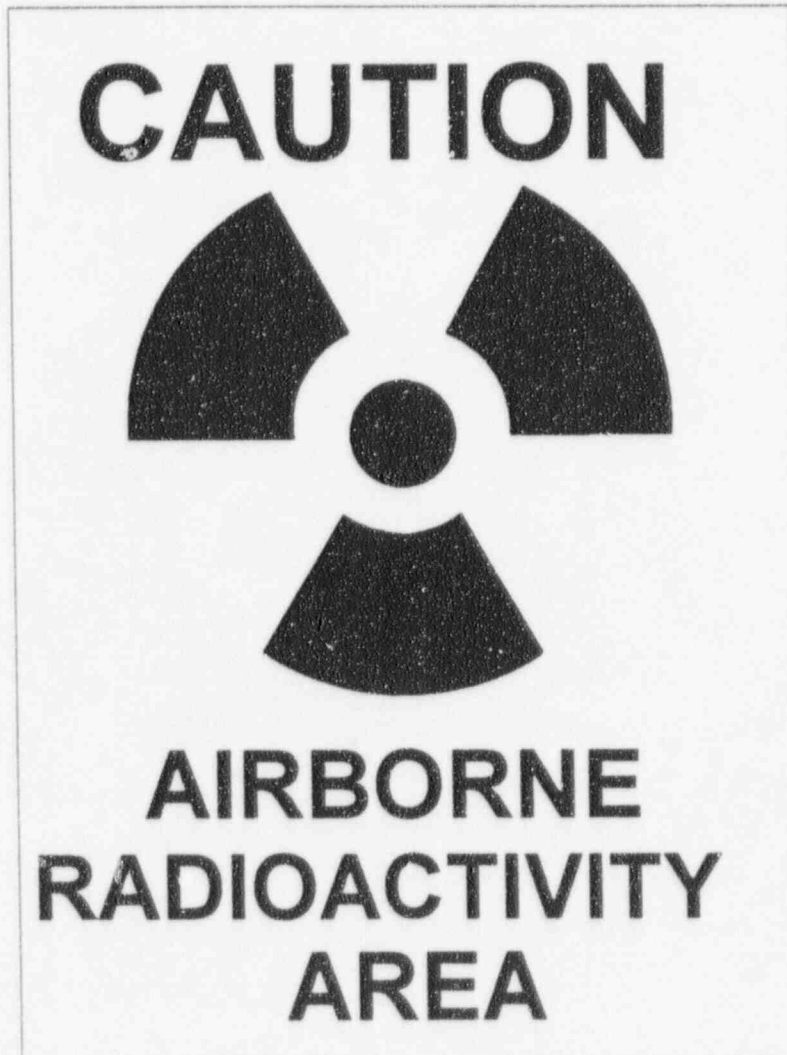
3.2.6.3

High Radiation Area - The following sign must be posted in each area, accessible to individuals, where radiation levels could result in a individual receiving a dose equivalent in excess of 100 millirem (1 mSv) in 1 hour at 30 centimeters from the radiation source or from any surface that the radiation penetrates.



January 1, 1994 (Change 1)

3.2.6.4 Airborne Radioactivity Area - The following sign must be posted in any area in which airborne radioactivity exceeds the limits specified in 10 CFR 20, Appendix B, Table 1 except as amended by license.

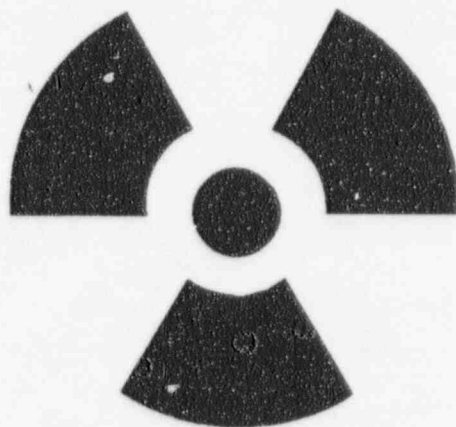


January 1, 1994 (Change 1)

3.2.6.5

Contaminated Area - The following sign must be posted in any area in which removable contamination exceeds the "clean" limits of Section 3.2.3.5:

**CAUTION**



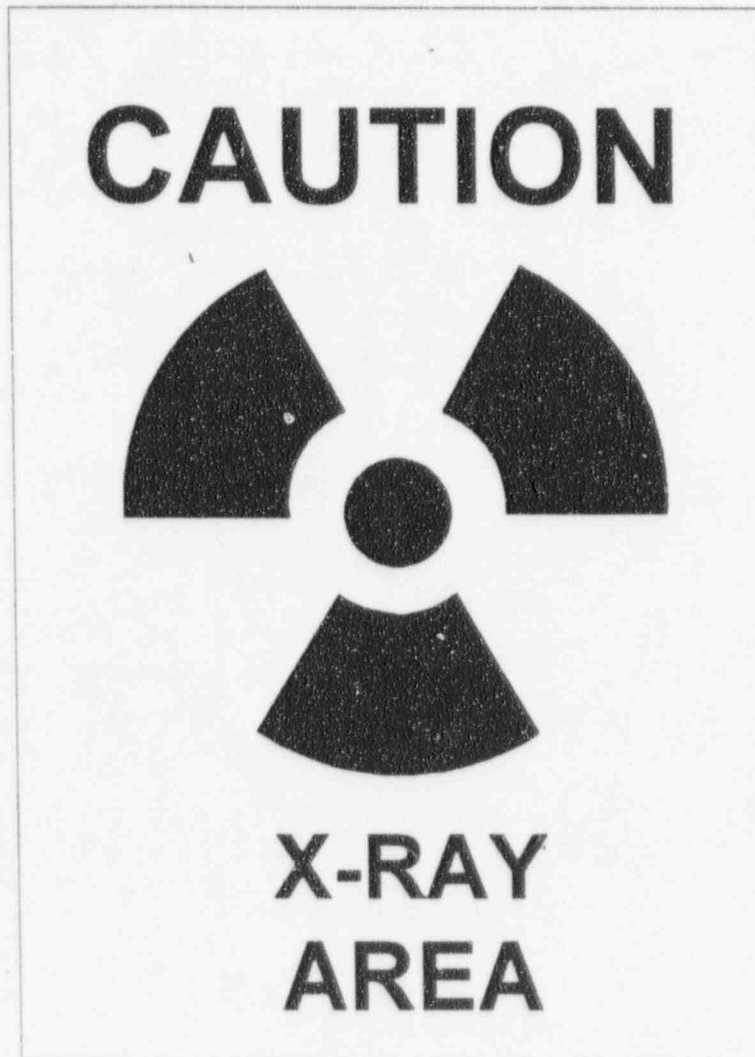
**SURFACE  
CONTAMINATION**

January 1, 1994 (Change 1)



3.2.6.6

Xrays - The following sign must be posted in each room or area in which an x-ray machine or an x-ray producing device is used:



January 1, 1994 (Change 1)

3.2.6.7

Additional Inserts - Other inserts are available from the HS&SO and can be used in combination with the above basic signs. Some examples are presented below:



**EXPERIMENT IN  
PROGRESS**


**DOSIMETRY REQUIRED**

**RESPIRATORY PROTECTION  
REQUIRED**

**REQUIREMENT  
FOR ENTRY**

3.2.6.8

Radiation Labels - All sources of ionizing radiation and/or their containers must be clearly labeled with the standard radiation symbol and appropriate information. The HS&SO will provide the tags. Only the HS&SO personnel may remove the tags. The total activity of sources in containers should be listed, by radionuclide, on the following label:

<p><b>CAUTION</b></p>  <p><b>RADIOACTIVE MATERIAL</b></p> <p>ISOTOPE _____ AMOUNT _____ RADIATION _____ DATE _____ BY _____</p> <p>DO NOT REMOVE THIS TAG WITHOUT AUTHORIZATION OF _____</p>
---

January 1, 1994 (Change 1)

**Attachment F**  
to NASA letter dated March 7, 1990  
(Updated 6/7/95)

Receiving packages of radioactive materials at GSFC.

1. All incoming packages of radioactive material will be monitored for levels of radiation and contamination as soon as practicable after receipt. In all cases, monitoring will be accomplished within the time limits specified in 10 CFR §20.1906.
2. After monitoring at the receiving station, the package will be transported to the health physics laboratory for further analysis.
3. The procedure for opening incoming packages of radioactive material will be as follows:
  - a. The package will be opened in a designated radiation safety laboratory.
  - b. Receiving personnel will in all cases wear appropriate protective clothing for the hazards associated with the source. Specific protective clothing will be dependent upon source strength, physical and chemical form, and any other special or unusual circumstances.
4. In the event of any radiation or contamination test results above those specified in 10 CFR §71.87(i) the NRC will be notified immediately.

**Attachment G**  
to NASA letter dated March 7, 1990  
(updated 6/7/95)

**ITEM 11 - WASTE MANAGEMENT** - Low Level Waste (LLW) material designated for disposal is collected, inventoried, packaged, and monitored by the Health Physics Unit.

**11.1 - Waste Identification.**

- a. The amount of waste stored will not exceed authorized possession limits.
- b. Estimated Maximum Amount to be Stored: Storage will not exceed a volume of 7 cubic meters ( $m^3$ ), nor an activity level (per radionuclide) greater than the authorized possession limit.
- c. Characterization of Waste to be Stored: Only solid, Class A waste will be stored. Volume reduction, solidification or other waste treatment will be performed as needed under an interagency agreement with the US Army Defense Consolidation Facility. There will be no additional non-radiological properties of LLW stored at this facility.

d. LLW Currently Being Stored:

<u>Radionuclide</u>	<u>Volume (<math>m^3</math>)</u>	<u>Activity (Curies)</u>
Tritium ( $H^3$ )	0.04	1.7

- e. Additional Approvals: Currently registered with the State of Maryland and have been assigned waste generator number.

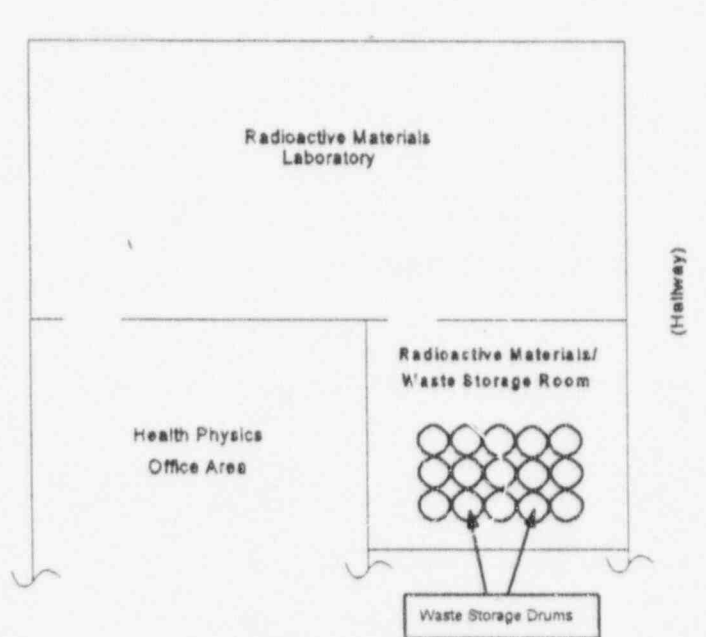
**11.2 - Plans for Final Disposal**

- a. A disposal facility is not available at present for disposal of LLW. Onsite interim storage is currently used.
- b. The Appalachian Compact disposal facility will be the point of final disposal. The facility siting process is well under way and final construction of the facility is projected for the year 2000. If, in the interim, another disposal facility becomes available to us, we will use our interagency agreement with the US Army to dispose of our LLW.
- c. Within 90 days of disposal facility operation we will begin shipment of waste. It should take no longer than 6 months to move out all stored LLW. (The time limits are estimates and will depend on the availability of the broker and priorities of the Appalachian Compact).



### 11.3 - Physical Description of Storage Area

- a. Waste will be stored in 55 gallon drums suitable for use as Type A containers. The storage area is located in Building 5, Room C67B as shown in the following diagram:



- b. From one-to-five 55-gallon drums of LLW will accumulate annually up to a maximum of 30 drums prior to disposal at the Appalachian Compact Facility.
- c. Building 5 is a three story cement block building. The walls of the storage room are constructed of "filled" cement block to provide additional radiation shielding.
- d. The storage room is located on the first floor and has only one entrance door. The area is kept locked and only Health Physics and Safety personnel have access.
- e. Positive ventilation is provided to insure temperature and humidity control. Exhaust air is vented to the Radioactive Materials Laboratory which is equipped with a high efficiency particulate air ventilation system installed in the laboratory hood. Room air escapes through this filtration system. Room air dampers close whenever the hood ventilation system is deactivated. No air contamination is expected to occur from the materials stored in this area.
- f. The room is equipped with two heat-activated sprinkler heads. However, the risk of fire in the room is basically non-existent due to the lack of combustible materials stored here.

- g. There would be no exposure of the waste to extremes of temperature and humidity.
- h. Vulnerability to other hazards such as tornado, hurricane, flood, etc. would be minimal due to the protected location of the room within the main building.

#### 11.4 - Packaging and Container Integrity

- a. 55-gallon drums capable for use as Type A shipping containers will be used package and store the LLW. Storage life should far exceed the projected 5-year storage projection since no caustics, corrosives or other hazardous materials will be stored.
- b. LLW Inspection Program: The Health Physics Staff will conduct semi-annual inventories of the material and quarterly radiation and contamination surveys to insure waste integrity and containment.

#### 11.5 - Radiation Protection

- a. Semi-annual monitoring using portable radiation detectors will be performed. The primary shielding wall of the waste storage area will be continuously monitored using thermoluminescent dosimetry (TLD) which is processed on a quarterly basis. The storage area will be surveyed on a quarterly basis as stated in paragraph 11.4b (above) and will be posted in accordance with 10 CFR 20.1902.
- b. Exposure rates at external portions of the room will not exceed 2 millirem per hour at 30 centimeters from the exterior walls nor will exposure to the general public exceed 100 millirem in a year. Placement of TLD's on exterior walls will be used to monitor this exposure.
- c. Local fire protection officials are aware of the materials used at the facility. Periodic briefings are provided by the GSFC Safety Staff. The RPO will provide direction and instructions to responders in the event of an emergency.
- d. Waste material is included on a computerized inventory which describes its location and activity. Waste transfer receipts are maintained whenever the material is transferred to a disposal facility.

#### 11.6 - Training

Health Physics personnel are provided training in the proper packaging, handling, placement, inspection, surveying and emergency response on a recurring basis. The training is commensurate with the training required for handling specific radioactive materials and their preparation for shipment as described in 49 CFR 172.

#### 11.7 - Financial Assurance

A certification of financial assurance has been prepared and is a part of this license.

#### 11.8 - Emergency Preparedness

Emergency Procedures for Radiological Emergency has been prepared and is a part of this license.

: (FOR LFMS USE)  
: INFORMATION FROM LTS  
: -----  
:  
:  
:

BETWEEN:

LICENSE FEE MANAGEMENT BRANCH, ARM  
AND  
REGIONAL LICENSING SECTIONS

: PROGRAM CODE: 03610  
: STATUS CODE: 0  
: FEE CATEGORY: EX 3L 1D  
: EXP. DATE: 20000731  
: FEE COMMENTS: -----  
: DECOM FIN ASSUR REQ: Y  
: .....  
:

LICENSE FEE TRANSMITTAL

A. REGION

*II*

1. APPLICATION ATTACHED

APPLICANT/LICENSEE: NATIONAL AERONAUTICS & SPACE ADM.  
RECEIVED DATE: 960703  
DOCKET NO: 3004538  
CONTROL NO.: 123398  
LICENSE NO.: 19-05748-02  
ACTION TYPE: AMENDMENT

2. FEE ATTACHED

AMOUNT: -----  
CHECK NO.: -----

3. COMMENTS

SIGNED *M. A. Perkins*  
DATE *7/10/96*

B. LICENSE FEE MANAGEMENT BRANCH (CHECK WHEN MILESTONE 03 IS ENTERED /\_\_/) )

1. FEE CATEGORY AND AMOUNT: -----

2. CORRECT FEE PAID. APPLICATION MAY BE PROCESSED FOR:

AMENDMENT -----  
RENEWAL -----  
LICENSE -----

3. OTHER -----  
-----

SIGNED -----  
DATE -----