

MATERIALS LICENSE

Amendment No. 16
CAC

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.

| | | |
|--|---|--|
| <p>Licensee</p> <p>1. National Aeronautics & Space Administration</p> <p>2. Ames Research Center M/S 218-1 Moffett Field, California 94035-1000</p> | <p>In accordance with letter dated April 2, 1997</p> <p>3. License Number 04-07845-04 is amended in its entirety to read as follows:</p> <p>4. Expiration Date September 30, 2002</p> <p>5. Docket or Reference No. 030-20435</p> | |
| <p>6. Byproduct, Source, and/or Special Nuclear Material</p> <p>A. Any byproduct material with Atomic Numbers 3 - 83 and with a half-life of less than 120 days</p> <p>B. Carbon-14</p> <p>C. Calcium-45</p> <p>D. Any byproduct material</p> <p>E. Hydrogen-3</p> <p>F. Nickel-63</p> <p>G. Hydrogen-3</p> <p>H. Cesium-137</p> <p>I. Phosphorus-32</p> <p>J. Phosphorus-33</p> <p>K. Sulfur-35</p> | <p>7. Chemical and/or Physical Form</p> <p>A. Any, except as sealed sources</p> <p>B. Any</p> <p>C. Any, except as sealed sources</p> <p>D. Sealed sources</p> <p>E. Any</p> <p>F. Foils or plated sources in detector cells</p> <p>G. Titanium tritide or scandium tritide foils in detector cells</p> <p>H. Sealed source</p> <p>I. Any</p> <p>J. Any</p> <p>K. Any</p> | <p>8. Maximum Amount that Licensee May Possess at Any One Time Under This License</p> <p>A. Not to exceed 200 millicuries per radionuclide and 5 curies total</p> <p>B. 2 curies</p> <p>C. 200 millicuries</p> <p>D. Not to exceed 1 millicurie per source and 1 curie total</p> <p>E. 2 curies</p> <p>F. Not to exceed 15 millicuries per foil or source and 5 curies total</p> <p>G. Not to exceed 1 curie per foil and 20 curies total</p> <p>H. 1.4 millicuries</p> <p>I. 2 curies</p> <p>J. 2 curies</p> <p>K. 2 curies</p> |

230029

9704230166 970403
PDR ADOCK 03020435
C PDR



011
ML40

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License Number

04-07845-04

Docket or Reference Number

030-20435

Amendment No. 16

| | | |
|------------------|---|--|
| L. Chromium-51 | L. Any | L. 2 curies |
| M. Iron-55 | M. Any | M. 2 curies |
| N. Iodine-125 | N. Any, except as sealed sources | N. 2 curies |
| O. Americium-241 | O. Sealed sources | O. Not to exceed 45 millicuries per source and 5 curies total |
| P. Cesium-137 | P. Sealed sources (Troxler Dwg. A-102112) | P. Not to exceed 10 millicuries per source and 100 millicuries total |
| Q. Americium-241 | Q. Sealed neutron sources (Troxler Dwg. A-102451) | Q. Not to exceed 50 millicuries per source and 200 millicuries total |
| R. Cadmium-109 | R. Sealed Source (Isotope Products Laboratories XFB Series) | R. 10 millicuries |
| S. Polonium-210 | S. Any | S. 1 millicurie |
| T. Curium-244 | T. Calibration or reference source | T. Not to exceed 1 microcurie per source and 2 microcuries total |
| U. Cesium-137 | U. Sealed source (3M Company Model 4D6L) | U. 1.1 curie |

9. Authorized use

- A. through N. For research and development as defined in Section 30.4 of 10 CFR Part 30 including instrument calibration, use of gas chromatography units, testing of instrumentation, and laboratory research including animal studies.
- O. For use in bone mineral analyzers for bone mineral studies on animals and other laboratory research.

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License Number

04-07845-04

Docket or Reference Number

030-20435

Amendment No. 16

9. Authorized Use (Continued)

- P. and Q. For use in Troxler Model 3400 Series Moisture-Density gauges to measure properties of construction materials.
- R. and S. For use in an ARACOR laboratory research x-ray instrument for geological and exobiological measurements.
- T. For use in conjunction with a Tissue Equivalent Proportional Counter (TEPC) which was custom built by Far West Technology, Inc. The TEPC detector and calibration source will be placed within a Boeing Co. device which will then be mounted in NASA aircraft.
- U. For use in a J.L. Shepherd and Associates Model 28-6 instrument calibrator for calibration of the licensee's survey instruments.

- 10. Licensed material shall be used only at the licensee's facilities located at Ames Research Center, Moffett Field, California, and other NASA facilities and temporary job sites of the licensee anywhere in the United States as approved by the licensee's Radiation Safety Committee.
- 11. A. Licensed material shall only be used by, or under the supervision of, individuals designated by the Radiation Safety Committee, Linda L. Jahnke, Chairperson.
- B. The Radiation Safety Officer for this license is William R. Vermeere.
- 12. A. Sealed sources and detector cells shall be tested for leakage and/or contamination at intervals not to exceed 6 months or at such other intervals as specified by the certificate of registration referred to in 10 CFR 31.10.
- 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 3 months.
- C. In the absence of a certificate from a transferor indicating that a leak test has been made within 6 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.

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License Number

C4-07845-04

Docket or Reference Number

030-20435

Amendment No. 16

12. (Continued)

E. Sealed sources need not be leak tested if:

- (i) they contain only hydrogen-3; or
- (ii) they contain only a radioactive gas; or
- (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 transferred 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 leak 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 in accordance with 10 CFR 30.50(b)(2), and the source shall be removed immediately from service and decontaminated, repaired, or disposed of in accordance with Commission regulations. The report shall be filed within 5 days of the date the leak test result is known with the U.S. Nuclear Regulatory Commission, Region IV 611 Ryan Plaza Drive, Suite 400, Arlington, Texas 76011, ATTN: Director, Division of Nuclear Material Safety. The report shall specify the source involved, the test results, and corrective action taken.

G. Tests for leakage and/or contamination shall be performed by the licensee or by other persons specifically licensed by the Commission or an Agreement State to Perform such services.

13. A. The licensee shall not use licensed material in or on human beings except as provided otherwise by specific condition of this license.

B. The licensee shall not use licensed material in field applications where activity is released except as provided otherwise by specific condition of this license.

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License Number

04-07845-04

Docket or Reference Number

030-20435

Amendment No. 16

14. The licensee is authorized to transport licensed material only in accordance with the provisions of 10 CFR Part 71, "Packaging and Transportation of Radioactive Material."
15.
 - A. Detector cells containing a titanium tritide foil or a scandium tritide foil shall only be used in conjunction with a properly operating temperature control mechanism which prevents the foil temperature from exceeding that specified by the manufacturer and approved by NRC.
 - B. When in use, detector cells containing a titanium tritide foil or a scandium tritide foil shall be vented to the outside.
16. Sealed sources containing licensed material shall not be opened or sources removed from source holders by the licensee.
17. Maintenance, repair, cleaning, replacement and disposal of foils contained in detector cells shall be performed only by the device manufacturer or other persons specifically authorized by the Commission or an Agreement State to perform such services.
18. The licensee shall conduct a physical inventory every 6 months to account for all sources and/or devices received and possessed under the license.
19.
 - A. When unsealed quantities of I-125 or I-131 are used in excess of 10 millicuries, the licensee shall conduct a bioassay program in accordance with procedures set forth in Regulatory Guide 8.20: "Applications of Bioassay for I-125 and I-131", Revision 1, September 1979.
 - B. When unsealed quantities of H-3 are used in excess of 100 millicuries, the licensee shall conduct a bioassay program in accordance with procedures set forth in "Applications of Bioassay for Tritium", dated June 1983.
20. The licensee is authorized to hold radioactive material with a physical half-life of less than 120 days for decay-in-storage before disposal in ordinary trash provided:
 - A. Radioactive waste to be disposed of in this manner shall be held for decay a minimum of 10 half-lives.
 - B. Before disposal as ordinary trash, byproduct material shall be surveyed at the container surface with the appropriate meter set on its most sensitive scale and with no interposed shielding to determine that its radioactivity cannot be distinguished from background. All radiation labels shall be removed or obliterated.

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License Number

04-07845-04

Docket or Reference Number

030-20435

Amendment No. 16

21. Prior to release of premises and equipment used in conjunction with licensed material, the licensee shall conduct a radiation survey to establish that contamination is within the limits specified in Guidelines for Decontamination of Facilities and Equipment prior to Release for unrestricted use of Termination of Licenses for Byproduct, Source, or Special Nuclear Material", dated July 1982.
22. The licensee shall maintain records of information related to decommissioning at Ames Research Center, Moffett Field, California, as specified in 10 CFR 30.35(d) until this license is terminated by the Commission.
23. 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. Letter dated January 22, 1990
 - B. Application dated April 21, 1990, except for the Radiation Safety Guide
 - C. Letter dated June 23, 1992
 - D. Letter dated March 18, 1993
 - E. Letter received June 2, 1993
 - F. Letter dated January 18, 1994
 - G. Letter dated February 10, 1994
 - H. Letter dated January 17, 1995, enclosing Appendices 1-7, including the Radiation Safety Guide.
 - I. Letter received February 1, 1995
 - J. Letter dated October 24, 1996
 - K. Correspondence dated February 3, 1997
 - L. Letter dated April 2, 1997

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Date APR 03 1997

By Beth A. Prange
Materials Branch
Region IV, WCFO
Walnut Creek, California 94596

BETWEEN:

License Fee Management Branch, ARM
and
Regional Licensing Sections

(FOR LFMS USE)
INFORMATION FROM LTS

Program Code: 03610
Status Code: 0
Fee Category: EX 3L
Exp. Date: 20020930
Fee Comments:
Decom Fin Assur Req'd: Y
.....

LICENSE FEE TRANSMITTAL

A. REGION

1. APPLICATION ATTACHED

Applicant/Licensee: NATIONAL AERONAUTICS & SPACE ADM.
Received Date: 970403
Docket No.: 3020435
Control No.: 572482
License No.: 04-07845-04
Action Type: Amendment

2. FEE ATTACHED

Amount: _____
Check No.: _____

3. COMMENTS

Signed _____
Date _____

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 _____



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV

Walnut Creek Field Office
1450 Maria Lane
Walnut Creek, California 94596-5368

APR 03 1997

National Aeronautics
& Space Administration
ATTN: William R. Vermeere
Radiation Safety Officer
Ames Research Center M/S 218-1
Moffett Field, California 94035-1000

SUBJECT: LICENSE AMENDMENT

Please find enclosed License No. 04-07845-04. You should review this license carefully and be sure that you understand all conditions. If you have any questions, you may contact the reviewer who signed your license at (510) 975-0250.

NRC expects licensees to conduct their programs with meticulous attention to detail and a high standard of compliance. Because of the serious consequences to employees and the public which can result from failure to comply with NRC requirements, you must conduct your program involving radioactive materials in accordance with the conditions of your NRC license, representations made in your license application, and NRC regulations. In particular, note that you must:

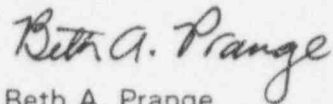
1. Operate in accordance with NRC regulations 10 CFR Part 19, "Notices, Instructions and Reports to Workers: Inspection and Investigations," 10 CFR Part 20, "Standards for Protection Against Radiation," and other applicable regulations.
2. Possess radioactive material only in the quantity and form indicated in your license.
3. Use radioactive material only for the purpose(s) indicated in your license.
4. Notify NRC in writing of any change in mailing address (no fee required if the location of radioactive material remains the same).
5. Request and obtain written NRC consent before transferring your license or any right thereunder, either voluntarily or involuntarily, directly or indirectly, through transfer of control of your license to any person or entity. A transfer of control of your license includes not only a total change of ownership, but also a change in the controlling interest in your company whether it is a corporation, partnership, or other entity. In addition, appropriate license amendments must be requested and obtained for any other planned changes in your facility or program that are contrary to your license or contrary to representations made in your license application, as well as supplemental correspondence thereto, which are incorporated into your license. A license fee may be charged for the amendments if you are not in a fee-exempt category.

6. Maintain in a single document decommissioning records that have been certified for completeness and accuracy listing all the following items applicable to the license:
 - Onsite areas designated or formerly designated as restricted areas as defined in 10 CFR 20.3(a)(14) or 20.1003.
 - Onsite areas, other than restricted areas, where radioactive materials in quantities greater than amounts listed in Appendix C to 10 CFR 20.1001-20.2401 have been used, possessed, or stored.
 - Onsite areas, other than restricted areas, where spills or other unusual occurrences involving the spread of contamination in and around the facility, equipment, or site have occurred that required reporting pursuant to 10 CFR 30.50(b)(1) or (b)(4), including areas where subsequent cleanup procedures have removed the contamination.
 - Specific locations and radionuclide contents of previous and current burial areas within the site, excluding radioactive material with half-lives of 10 days or less, depleted uranium used only for shielding or as penetrators in unused munitions, or sealed sources authorized for use at temporary job sites.
 - Location and description of all contaminated equipment involved in licensed operations that is to remain onsite after license termination.
7. Submit a complete renewal application with proper fee, or termination request at least 30 days before the expiration date on your license. You will receive a reminder notice approximately 90 days before the expiration date. Possession of radioactive material after your license expires is a violation of NRC regulations.
8. Request termination of your license if you plan to permanently discontinue activities involving radioactive material.

You will be periodically inspected by NRC. Failure to conduct your program in accordance with NRC regulations, license conditions, and representations made in your license application and supplemental correspondence with NRC will result in enforcement action against you. This could include issuance of a notice of violation; imposition of a civil penalty; or an order suspending, modifying, or revoking your license as specified in the "General Statement of Policy and Procedure for NRC Enforcement Actions" (Enforcement Policy), 60 FR 34381, June 30, 1995.

Thank you for your cooperation.

Sincerely,

A handwritten signature in cursive script that reads "Beth A. Prange".

Beth A. Prange
Sr. Health Physicist (Licensing)
Materials Branch

Docket: 030-20435
License: 04-07845-04
Control: 572482

Enclosures: As stated

National Aeronautics
& Space Administration

-4-

bcc:

Docket File
WCFO Inspection File
LFDCB, T-9 E10
State of CA (License Only)

DOCUMENT NAME: G:\beth\572482

To receive copy of document, indicate in box: "C" = Copy without enclosures "E" = Copy with enclosures "N" = No copy

| | | | | | | | | |
|---------|-----|-------------|--|---------|--|---------|--|---------|
| RIV:MB | N | C:MB | | | | | | |
| BPrange | BAP | Fwenslawski | | | | | | |
| 04/3/97 | | 04/ /97 | | 04/ /97 | | 04/ /97 | | 04/ /97 |

OFFICIAL RECORD COPY

Amendment

National Aeronautics and
Space Administration

Ames Research Center
Moffett Field, California 94035



April 2, 1997

Beth A. Prange
Materials Branch
Nuclear Regulatory Commission
Region IV, WCFO
Walnut Creek, California 94596

Subject: Amendment of License #04-07845-04
Docket # 030-20435

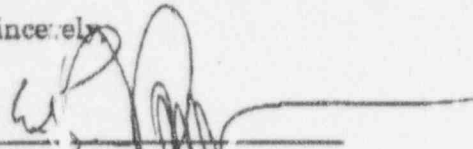
Dear Ms. Prange

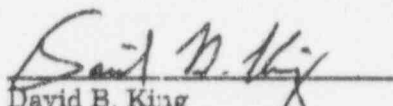
The NASA Ames Research Center is requesting an amendment to its NRC Radioactive Materials License. We are in need of a rapid review of this request as it is a part of an international evaluation of the quality factor(QF) of particles found at the atmosphere between 60,000 and 95,000 feet scheduled to begin in May, 1997. We have recently repowered our ER-2 aircraft to allow for this increased ceiling. Amendment 15 to our license provided authorization for a 1 microcurie source Curium-244 to be used in a Tissue Equivalent Proportional Counter (TEPC). We have just discovered that the Canadian contingency of this experiment is also planning on using a TEPC, an exact duplicate of the device manufactured by Far West Technology for Boeing Co.

We would like to amend our license under item 8T to read:

Not to exceed one microcurie per source and two microcuries total.

Sincerely,


William R. Vermeere
Radiation Safety Officer
NASA Ames Research Center


David B. King
Industrial Hygiene/Health Physics
NASA Ames Research Center

cc: C. Burrous
S. Brisbin
S. Olliges
W. Hall
R. Reynolds
J. Arvesen
J. Barrilleaux

572482