

MATERIALS LICENSE

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, 37, 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 style="text-align: center;">Licensee</p> <p>1. National Aeronautics & Space Administration John H. Glenn Research Center</p> <p>2. Mailstop 6-4 21000 Brookpark Road Cleveland, OH 44135</p>	<p>In accordance with application dated September 22, 2014,</p> <p>3. License number 34-00507-16 is renewed in its entirety to read as follows:</p> <hr/> <p>4. Expiration date March 31, 2025</p> <hr/> <p>5. Docket No. 030-05626 Reference No.</p>
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<p>6. Byproduct, source, and/or special nuclear material</p> <p>A. Any byproduct material with atomic number 3 - 83 inclusive</p> <p>B. Strontium-90</p> <p>C. Americium-241</p> <p>D. Americium-241</p> <p>E. Cesium-137</p> <p>F. Promethium-145</p> <p>G. Cesium-137</p> <p>H. Americium-241</p>	<p>7. Chemical and/or physical form</p> <p>A. Activated materials and components</p> <p>B. Sealed source (Isotope Products, Inc.)</p> <p>C. Plated Foil Source (Isotope Products Laboratories Model AFR Series)</p> <p>D. Foil sources (Manufactured by AEA Technologies, Inc. and Nycomed Amersham Plc Model AMM.1001H)</p> <p>E. Sealed sources (NBS or Isotope Products, Inc.)</p> <p>F. Sealed source (NEN X-2 X-Ray Reference Source)</p> <p>G. Sealed sources registered either with NRC under 10 CFR 32.210 or with an Agreement State and incorporated in a compatible gauging device as specified in Item 9 of this license.</p> <p>H. Sealed sources registered either with NRC under 10 CFR 32.210 or with an Agreement State and incorporated in a compatible gauging device as specified in Item 9 of this license</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 isotope</p> <p>B. 1 microcurie</p> <p>C. 100 microcuries</p> <p>D. No single source to exceed 1 microcurie; total activity not to exceed 20 microcuries</p> <p>E. No single source to exceed 15 microcuries; total activity not to exceed 30 microcuries</p> <p>F. 1 microcurie</p> <p>G. No single source to exceed the maximum activity specified in the certificate of registration issued by NRC or an Agreement State; total activity not to exceed 9 millicuries</p> <p>H. No single source to exceed the maximum activity specified in the certificate of registration issued by NRC or an Agreement State; total activity not to exceed 44 millicuries</p>
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**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License Number

34-00507-16

Docket or Reference Number

030-05626

Amendment No. 53

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| I. Any byproduct material with atomic number 1 - 83 inclusive | I. Environmental Samples | I. Not to exceed 1.4 microcuries per isotope; total activity not to exceed 11 microcuries |
| J. Uranium-234 | J. Environmental Samples | J. 47 nanoocuries |
| K. Uranium-238 | K. Environmental Samples | K. 47 nanoocuries |
| L. Plutonium-238 | L. Environmental Samples | L. 47 nanocuries |
| M. Plutonium-239 | M. Environmental Samples | M. 47 nanocuries |
| N. Americium-241 | N. Environmental Samples | N. 47 nanocuries |
| O. Americium-241 | O. Calibration or reference sources | O. No single source to exceed 0.2 microcuries; total activity not to exceed 2 microcuries |
| P. Cesium-137 | P. Calibration or reference sources | P. No single source to exceed 0.06 microcuries; total activity not to exceed 0.6 microcuries |
| Q. Europium-152 | Q. Calibration or reference sources | Q. No single source to exceed 0.5 microcuries; total activity not to exceed 5 microcuries |

9. Authorized use:

- A. For research and development as described in 10 CFR 30.4. Possession incident to the radiological characterization surveys of a shut-down cyclotron. Includes collection and analysis of samples and interference removal of activated equipment and infrastructure associated with the licensee's cyclotron facility.
- B. through D. For research and development as described in 10 CFR 30.4.
- E. and F. Possession and storage only with intent to dispose.
- G. and H. In Troxler Electronic Laboratories Model 3440 Plus portable gauging devices for measuring physical properties of materials, for research and development as described in 10 CFR 30.4.
- I. through N. For use in Radiological and Environmental Sciences Laboratory (RESL) Mixed Analyte Performance Program (MAPEP) samples with gamma spectroscopy systems in support of decommissioning tasks.
- O. through Q. For use in Eckert and Ziegler Analytics, Inc., custom sources for instrument calibration.

CONDITIONS

10. A. Licensed material may be used and stored at the license's facilities located at John H. Glenn Research Center at Lewis Field, 21000 Brookpark Road, Cleveland, Ohio, and at Plum Brook Station, 6100 Columbus Avenue, Sandusky, Ohio.

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**License Number
34-00507-16Docket or Reference Number
030-05626

Amendment No. 53

- B. Licensed material in Subitems 6.G. and 6.H. may also be used at temporary job sites of the licensee anywhere in the United States where the U.S. Nuclear Regulatory Commission maintains jurisdiction for regulating the use of licensed material.
11. A. Licensed material in Subitems 6.A. through 6.F. and 6.I through 6.Q. shall only be used by, or under the supervision of, Christopher J. Blasio, M.S., or Roderick C. Case.
- B. Licensed material in Subitems 6.G. and 6.H. shall only be used by, or under the supervision and in the physical presence of Christopher J. Blasio, M.S., or other individuals who have successfully completed the training described in the letter dated March 25, 2015.
12. The Radiation Safety Officer (RSO) for this license is Christopher J. Blasio, M.S.
13. In addition to the possession limits in Item 8, the licensee shall further restrict the possession of licensed material to quantities below the minimum limit specified in 10 CFR 30.35(d) for establishing decommissioning financial assurance.
14. 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.
15. A. Sealed sources, detector cells, and foil sources shall be tested for leakage and/or contamination at intervals not to exceed the intervals specified by the certificate of registration issued by the U.S. Nuclear Regulatory Commission under 10 CFR 32.210 or by an Agreement State.
- B. In the absence of a certificate from a transferor indicating that a leak test has been made within the intervals specified in the certificate of registration issued by the U.S. Nuclear Regulatory Commission under 10 CFR 32.210 or by an Agreement State, prior to the transfer, a sealed source, detector cell or foil source received received from another person shall not be put into use until tested and the test results received.
- C. Sealed sources need not be leak tested if they contain only hydrogen-3; or they contain only a radioactive gas; or the half-life of the isotope is 30 days or less; or they contain not more than 100 microcuries of beta and/or gamma emitting material or not more than 10 microcuries of alpha emitting material.
- D. Sealed sources need not be leak tested if they 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 ten years without being tested for leakage and/or contamination.
- E. The leak test shall be capable of detecting the presence of 0.005 microcurie (185 becquerels) of radioactive material on the test sample. If the test reveals the presence of 0.005 microcurie (185 becquerels) or more of removable contamination, a report shall be filed with the U.S. Nuclear Regulatory Commission in accordance with 10 CFR 30.50(c)(2), and the source shall be removed immediately from service and decontaminated, repaired, or disposed of in accordance with Commission regulations.

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License Number

34-00507-16

Docket or Reference Number

030-05626

Amendment No. 53

- F. Tests for leakage and/or contamination shall be performed by the licensee or by other persons specifically licensed by the U.S. Nuclear Regulatory Commission or an Agreement State to perform such services.
- G. Records of leak test results shall be kept in units of microcuries and shall be maintained for three years.
16. Sealed sources, source rods, detector cells, or foil sources containing licensed material shall not be opened or sources removed or detached from source rods, gauges, or other source holders by the licensee, except as specifically authorized.
17. The licensee shall conduct a physical inventory every six months, or at other interval approved by the U.S. Nuclear Regulatory Commission, to account for all sealed sources and/or devices received and possessed under the license. Records of inventories shall be maintained for five years from the date of each inventory and shall include the radionuclides, quantities, manufacturer's name and model numbers, and the date of the inventory.
18. Except for maintaining labeling as required by 10 CFR Part 20, or 71, the licensee shall obtain authorization from the U.S. Nuclear Regulatory Commission before making any changes in the sealed source, device, or source-device combination that would alter the description or specifications as indicated in the respective certificate of registration issued either by the Commission pursuant to 10 CFR 32.210 or by an Agreement State.
19. Each portable gauge shall have a lock or outer locked container designed to prevent unauthorized or accidental removal of the sealed source from its shielded position. The gauge or its container must be locked when in transport. A minimum of two independent physical controls that form tangible barriers to secure portable gauges from unauthorized removal whenever the portable gauge is not under the control and constant surveillance of the licensee are required.
20. Any cleaning, maintenance, or repair of the gauges that requires removal of the source rod from the gauge shall be performed only by the manufacturer or by other persons specifically licensed by the Commission or an Agreement State to perform such services.
21. 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
34-00507-16Docket or Reference Number
030-05626

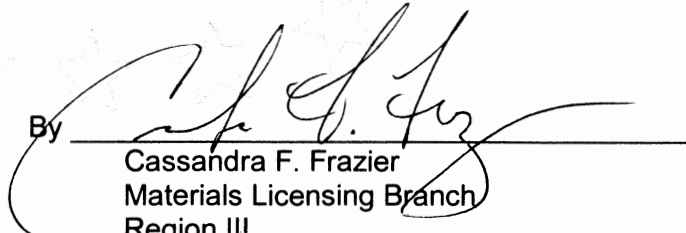
Amendment No. 53

22. 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 U.S. 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 September 22, 2014 (excluding attached NASA Occupational Health Manual Chapter 8 entitled "Radiation Protection for Radioactive Materials"); and
- B. Letters dated December 2, 2014, and March 25, 2015 (including attached Radiation Safety Briefing sheet and excluding item 2).

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Date MAR 27 2015

By


Cassandra F. Frazier
Materials Licensing Branch
Region III