

MATERIALS LICENSE

Amendment No. 11

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

Licensee

1. Beloit College
Department of Physics and
Astronomy
2. 700 College Avenue
Beloit, WI 53511

In accordance with letter dated
April 22, 1985

3. License number 48-00268-02 is amended in
its entirety to read as follows:

4. Expiration date June 30, 1990

5. Docket or
Reference No. 030-01148

6. Byproduct, source, and/or
special nuclear material

- A. Cobalt-60
- B. Americium-241
- C. Cesium-137

D. Plutonium

E. Any byproduct material

7. Chemical and/or physical
form

- A. Sealed sources
- B. Sealed source
- C. Sealed source
(New England Nuclear
Model No. NER-570)
- D. Sealed source
(Source No. N480E2)

E. Activation products

8. Maximum amount that licensee
may possess at any one time
under this license

- A. 1 millicurie
- B. 0.1 millicurie
- C. 120 millicuries
- D. 48 grams
- E. See Item 9.E. below

9. Authorized Use

- A. and B. Laboratory instruction of students.
- C. To be used in NEN Model NER-400 N or custom designed source holder for laboratory instruction of students.
- D. To be used in U.S. Nuclear Corp. Model NR-2-M3 Howitzer for education and training.
- E. Possession incident to the performance of irradiation experiments utilizing the Pu-Be source. To be used for student instruction.

CONDITIONS

10. Licensed material shall be used only at the licensee's facilities located at the Department of Physics and Astronomy, Beloit, Wisconsin.

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**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License number

48-00268-02

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Amendment No. 11

11. The licensee shall comply with the provisions of Title 10, Chapter 1, Code of Federal Regulations, Part 19, "Notices, Instructions and Reports to Workers; Inspections" and Part 20, "Standards for Protection Against Radiation."
12. Licensed material shall be used by, or under the supervision of, David A. Dobson or Robert O. Garrett.
13. Sealed sources containing licensed material shall not be opened.
14. A. (1) Each sealed source containing licensed material, other than Hydrogen 3, with a half-life greater than thirty days and in any form other than gas shall be tested for leakage and/or contamination at intervals not to exceed six months. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, a sealed source received from another person shall not be put into use until tested.
(2) Notwithstanding the periodic leak test required by this condition, any licensed sealed source is exempt from such leak tests when the source contains 100 microcuries or less of beta and/or gamma emitting material or 10 microcuries or less of alpha emitting material.
(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.
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 five (5) days of the test with the U. S. Nuclear Regulatory Commission, Region III, 799 Roosevelt Road, Glen Ellyn, Illinois 60137, describing the equipment involved, the test results, and the corrective action taken.
D. Tests for leakage and/or contamination shall be performed by the licensee or by other persons specifically authorized by the Commission or an Agreement State to perform such services.

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SUPPLEMENTARY SHEET**

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15. A. Each encapsulated plutonium source designed for the purpose of emitting neutron or gamma radiation shall be tested for leakage at intervals not to exceed six (6) months. In the absence of a certificate from a transferor indicating that a test has been made within six (6) months prior to the transfer, a sealed source received from another person shall not be put into use until tested.
- B. The test shall be capable of detecting the presence of 0.005 microcurie of alpha contamination on the test sample. The test sample shall be taken from the 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.
- C. If the test reveals the presence of 0.005 microcurie or more of removable alpha contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired by a person appropriately licensed to make such repairs or to be disposed of in accordance with the Commission regulations. Within five (5) days after determining that any source has leaked, the licensee shall file a report with the Material Licensing Branch, Division of Fuel Cycle and Material Safety, U. S. Nuclear Regulatory Commission, Washington, D.C. 20555, describing the source, the test results, the extent of contamination, the apparent or suspected cause of source failure, and the corrective action taken. A copy of the report shall be sent to the U. S. Nuclear Regulatory Commission, Region III, 799 Roosevelt Road, Glen Ellyn, Illinois 60137.
- D. 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 (6) months prior to the date of use or transfer.
- E. Notwithstanding the other provisions of this leak test condition, leak tests are not required on pacemakers implanted in experimental animals provided that a leak test shall be performed immediately following removal of the pacemakers from the animal.
16. Except for plutonium contained in a medical device designed for individual human application, no plutonium, regardless of form, shall be delivered to a carrier for shipment by air transport or transported in an aircraft by the licensee except in packages the design of which the NRC has specifically approved for transport of plutonium by air.
17. The licensee shall not use licensed material in or on human beings or in field applications where activity is released except as provided otherwise by specific condition of this license.

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

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18. Except as specifically provided otherwise by this license, the licensee shall possess and use licensed material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in application dated May 26, 1978; letters dated May 26, 1978, September 10, 1980, October 24, 1983, and April 22, 1985; and letter received August 15, 1983 (dated August 10, 1980). The Nuclear Regulatory Commission's regulations shall govern the licensee's statements in applications or letters, unless the statements are more restrictive than the regulations.



For the U.S. Nuclear Regulatory Commission

Original Signed

By Bruce S. Mallett

Materials Licensing Section, Region III

Date June 4, 1985

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