



# Oklahoma State University

DEPARTMENT OF ELECTRONICS & COMPUTER TECHNOLOGY  
COLLEGE OF ENGINEERING, ARCHITECTURE & TECHNOLOGY

STILLWATER, OKLAHOMA 74078-0160  
CRUTCHFIELD 202  
(405) 624-5716, 5717, 5720

February 24, 1987

U. S. Nuclear Regulatory Commission, Region IV  
Nuclear Material Safety Section  
611 Ryan Plaza Drive, Suite 1000  
Arlington, Texas 76011  
REFERENCE: Byproduct Material License #35-00237-03

Dear Sirs:

We wish to request an admendment to our Byproduct Material License to add authorization for 0.5 millicuries of Curium-244.

We wish to purchase a 0.5 millicurie source of Curium-244 to be used for alpha irradiation of materials in thermoluminescent research. The source is designed by and would be purchased from:

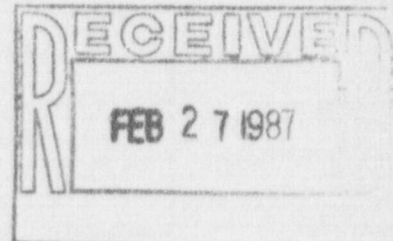
Daybreak Nuclear and Medical Systems, Inc.  
50 Denison Drive  
Guilford, Connecticut 06437  
(203) 453-3299

A description of the Curium-244 source to be purchased is provided below:

Source Model Number: AFR-244  
Active diameter of source: 0.5 inches  
Thickness of source: 0.25 inches  
Source window thickness: 1.8 mg/cm-squared  
Source window composition: Titanium

To support our request for the admendment, we offer the following explanations and assurances.

1. The responsibility for the use and storage of this source will be under the operational responsibility of qualified individuals designated by the Oklahoma State University Radiological Safety Committee. Dr. Stephen W. McKeever, assistant professor of Physics, has been designated as the person responsible for the safe use and storage of this source.
2. Dr. McKeever has been involved in irradiation research utilizing Co-60 and Sr-90/Y-90 for the past 5 years at Oklahoma State University. In addition, Dr. McKeever has 6 years of experience with Co-60 and Sr-90/Y-90 irradiators at the University of Birmingham (England) and the



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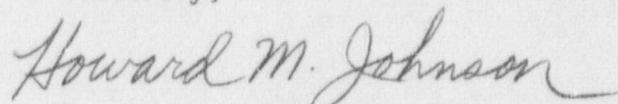
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University of Sussex. Dr. McKeever does also understand the problems associated with the use of alpha emitters. The Radiological Safety Committee believes that Dr. McKeever has sufficient training and experience to safely use this source of Curium-244.

3. The Curium-244 source will be stored in a Model 750 alpha irradiator also supplied by Daybreak Nuclear and Medical Systems. The Model 750 is a shielded enclosure in which the source is housed. The source is mounted on a solenoid-actuated arm that, when energized, brings the source out of the housing into position over the sample well for irradiation. The source-to-sample distance is approximately 0.04 inches. The active surface of the source cannot be accessed without disassembly of the enclosure.
4. This source will be leak tested once every six (6) months according to the schedule used for other sealed sources at OSU. If the source is found to be leaking ( $>0.005$  uCi) it will be immediately withdrawn from use and appropriate action taken to prevent contamination of the area.
5. A currently serviced alpha survey meter will be available near the irradiation area to check for possible leakage should the need arise.
6. All survey meters on the OSU campus are serviced and calibrated once each year under normal use.
7. Written operating procedures will be posted in the area to instruct all personnel concerning the proper use of the irradiator to prevent source damage. They will also be instructed on what action to take if source damage is suspected.
8. The Curium-244 irradiator will be used and stored in Room 252 of the Physical Sciences Building on the OSU Campus.

If I can furnish further information, please call me collect on (405) 624-5716, or by written correspondence at Cr-208, Oklahoma State University, Stillwater, OK 74078.

Sincerely,



Howard M. Johnson, Ph.D  
Associate Professor of  
Engineering Technology  
Radiation Safety Officer  
and Licensing Representative

HMJ:jl

cc: Dr. W. A. Sibley, Chairman  
Radiological Safety Committee

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