



November 22, 2017

Attn: Mr. Dennis Lawyer  
Division of Nuclear Materials Safety  
U.S. Nuclear Regulatory Commission, Region I  
2100 Renaissance Boulevard, Suite 100  
King of Prussia, PA 19406-2713

Re: Additional Information Requested License Amendment Request for License Amendment  
License No. 44-00728-13, Mail Control No. 601350

Mr. Lawyer,

This is in reference to your email dated November 2, 2017, requesting further information concerning the University of Vermont's application for a license amendment, License No. 44-00728-13, Control No. 01350, Docket No. 0301322.

In answer to your questions:

1.a. – Eighty to one hundred percent of all surfaces in areas of the building where licensed materials were used or stored were surveyed using appropriate radiation instrumentation. More attention was given to areas of higher potential contamination (i.e. sinks, hoods, benchtops, floors) in labs certified by the Radiation Safety Office that used unsealed radioactive materials. The Radiation Safety Office keeps a record of all current and past labs that use(d) and store(d) radioactive materials at the University of Vermont.

1.b. – The determination of detector sensitivity was done both empirically and theoretically.

For liquid scintillation counting (LSC), H-3 and C-14 standards were used and empirical efficiencies were calculated. For all other radionuclides measured with LSC theoretical efficiencies were determined by using a guide published by Beckman Coulter, Inc. *Isotope Booklet for Liquid Scintillation Counters*, 2002. We presumed that since the LSC efficiencies measured for H-3 and C-14 were comparable to the published efficiencies for H-3 and C-14 in the Beckman Isotope Booklet, it would be suitable to use other efficiencies listed in the booklet.

For GM and Scintillation detectors, each meter, at the time of calibration, had efficiencies determined by our calibration company, Radiation Control and Safety Services in Portsmouth, NH. Efficiencies were measured for P-32 (high-energy beta) and C-14 (low-

energy beta) for the Ludlum GM survey meter with a pancake detector and also for I-125 with the Ludlum NaI scintillation detector.

1.c. – The scan speed of the GM survey meter and NaI scintillation detector was approximately 3 - 5 cm per second but going slower over areas of higher potential contamination.

1.d. – The distance the detectors were held above the surface was approximately 3 cm for the GM detector and approximately 3 - 6 cm for the scintillation detector.

1.e. – The Radiation Safety Office approves, orders, receives and inventories all licensed radioactive materials at the University of Vermont. No new radioactive materials had been purchased, used or stored by lab groups in the Cook Building for over 3 years thus all short-lived (less than 120 days half-life) radionuclides would have decayed to greater than 9 half-lives.

1.f. – One lab contained a sealed source that required leak test. This source was disposed in 2004. The last leak test for this source prior to its disposal is attached.

2. The mailing address for Discovery Hall, the requested addition to our license, is;

University of Vermont  
Discovery Hall  
82 University Place  
Burlington, VT 05405

3. There will be no significant change in the scope of licensed material use with the addition of this new building. No changes in the University of Vermont's decommissioning fund plan and financial assurance is needed at this time.

I hope these answers are satisfactory. Please let me know if you require further information.

Sincerely yours,



Thomas Kellogg, RSO  
University of Vermont  
Radiation Safety Office  
004 Rowell Building  
Burlington, VT 05403  
Tel: 802-656-3283  
Email: Thomas.Kellogg@uvm.edu

Leak Test  
University of Vermont

Date of Testing	6/22/2004
Date of Counting	6/22/2004
Leak Test File No.	21
NRC License No.	44-00728-13
Source Nuclide	PU-239
Sealed Source	NEUTRON SOURCE
User	RSO
Location	LAF
Source Activity	2000 mCi
Source Calibration Date	11/08/63
Manufacturer	MONSANTO RESEARCH CORP.
Model	
Serial NO.	273
Source No.	MRC-PUBE-273
Type	PU:BE(31.98 GM OF PU METAL)
Radiation Type	NEUTRON/GAMMA
Output	2.84 x 1000000 NPS
Counter	ASP-2e
Gain	
High Voltage	1299
Window	
Base	
Background	6
Bkg. Time (mts)	1
Avg. Bkg. CPM	6
3Sigma Bkg.	7.35
Sample Counts	8
Sample Time (mts)	1
Avg. Sample CPM	8
Ref. Counts	979
Ref. Time (mts)	1
Avg. Ref. CPM	979
Ref. uCi.	0.001126
Ref. Date	8/27/65
Ref. No.	P-151
Ref. Nuclide	PU-239
Half Life	8789741 Days
Daysbetween(doc-ref.date)	14179
HL Elapsed	0.00
Decay Factor	1.00
Ref. Activity	0.00 uCi
Ref. Std. DPM	2496.93
Percent Eff.	38.97
Sample Net CPM	2.00
Ref. Net CPM	973.00
Sample Activity	0.000002 uCi
Min. Det. Activity	0.000012 uCi
Max Leak Allowed	0.005 uCi
Leak Above Limit	0 uCi
Tested By:	KEDDY BHARATHAN
Room Key # & Loc	dw 217 & h2121,l.t.file 21
Contact & Phone	detenbeck,bob x60064
Status	0