



UNIVERSITY OF MASSACHUSETTS  
AMHERST

117 Draper Hall  
40 Campus Center Way  
Amherst, MA 01003-9244

Environmental Health & Safety

voice: 413.545.2682  
fax: 413.545.2600  
www.ehs.umass.edu

February 3, 2006

NMSB3

U.S. Nuclear Regulatory Commission  
Attn: Licensing  
Region I  
475 Allendale Road  
King of Prussia, PA 19406

03034383

Re: Materials License No. 20-00882-0<sup>8</sup>~~8~~  
*not*

Dear Licensing Coordinator;

Please amend the above named license to reflect the following changes.

Please change the licensee name to:

University of Massachusetts Amherst

Please change the licensee address to:

Environmental Health and Safety  
117 Draper Hall  
40 Campus Center Way  
Amherst, Massachusetts 01003

Please change the Radiation Safety Officer to:

Vincent D. Chase, CHP

Attached please find Mr. Chase's resume. Please be advised that Mr. Chase is the Radiation Safety Officer for the university's Agreement State license of Broad Scope, Type A (attached).

Please contact Mr. Chase at 413-545-5153 if you have any questions regarding this matter.

Sincerely,

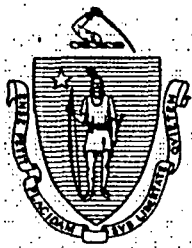
Donald A. Robinson, Ph.D., P.E.  
Director, Environmental Health and Safety

Attachments: Resume, Vincent D. Chase  
MA Dept of Public Health Materials License No. 60-0107

RECEIVED  
REGION 1  
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NMCS/RGN MATERIALS-002



The Commonwealth of Massachusetts  
Executive Office of Health and Human Services  
Department of Public Health  
Radiation Control Program  
90 Washington St., Dorchester MA 02121  
Phone (617)-427-2944 (617)-427-2925 Fax

MITT ROMNEY  
GOVERNOR

KERRY HEALEY  
LIEUTENANT GOVERNOR

RONALD PRESTON  
SECRETARY

PAUL J. COTE, JR.  
COMMISSIONER

March 15, 2005

Vincent P. Chase  
Program Head, Radiation Safety Services  
UMASS – Amherst  
117 Draper Hall  
40 Campus Center Way  
Amherst, MA 01003-9244

**RE: Receipt of Renewal Application  
License Number 60-0107**

Dear Mr. Chase,

This letter is to acknowledge the receipt of your application for the renewal of your license for UMASS - Amherst, License number 60-0107. The license will not expire until final action has been taken by this office.

If you have any questions concerning this renewal, please do not hesitate to contact me at (617) 427-294 at ext. 2048.

Sincerely,

A handwritten signature in cursive script that reads "Deborah Degenhart".

Deborah Degenhart  
Radiation Control Program



THE COMMONWEALTH OF MASSACHUSETTS  
 DEPARTMENT OF PUBLIC HEALTH  
 RADIATION CONTROL PROGRAM  
 MATERIALS LICENSE

Pursuant to Massachusetts General Laws Chapter 111, Sections 3, 5M, 5N, 5O and 5P and Massachusetts Regulations for the Control of Radiation, Section 120.100, Licensing of Radioactive Material, and in reliance on statements and representation heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer radioactive materials 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 105 CMR 120.000. This license shall be deemed to contain the conditions specified in 105 CMR 120.000 and is subjected to all applicable rules, regulations of the Department of Public Health, Commonwealth of Massachusetts, now or hereafter in effect and to any conditions specified below.

Licensee  1. University of Massachusetts Amherst	3. License Number: 60-0107 is amended in its entirety, in accordance with letter dated December 2, 2005, to read as follows:  Amendment No: <u>05</u>
2. Environmental Health and Safety 117 Draper Hall 40 Campus Center Way Amherst, Massachusetts 01003	4. Expiration Date: January 31, 2005
	5. Docket No: 11-0133

6. Radioactive Material	7. Chemical/Physical Form	8. Maximum Possession Limit
A. Any radioactive material with Atomic Nos. 3 through 83 inclusive with half-lives of 120 days or less	A. Any Form	A. Not to exceed 3.7 gigabecquerel (100 millicurie) per radionuclide and 370 gigabecquerel (10 curie) total
B. Any radioactive material with Atomic Nos. 1 through 83 inclusive with half-lives greater than 120 days	B. Any Form	B. See Condition 13
C. Phosphorus-32	C. Any Form	C. 1500 millicurie
D. Sulfur-35	D. Any Form	D. 1500 millicurie
E. Chromium-51	E. Any Form	E. 500 millicurie
F. Iodine-125	F. Any Form	F. 500 millicurie

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6. Radioactive Material	7. Chemical/Physical Form	8. Maximum Possession Limit
G. Iodine-131	G. Any Form	G. 200 millicurie
H. Hydrogen-3	H. Foils	H. 12 curies
I. Cobalt-60	I. Sealed Sources	I. 800 millicurie
J. Nickel-63	J. Sealed Source	J. 200 millicurie
K. Cadmium-109	K. Sealed Sources	K. 50 millicurie
L. Cesium-137	L. Sealed Sources	L. 450 millicurie
M. Polonium-210	M. Alpha Sources	M. 2 millicurie
N. Americium-241	N. Sealed Sources	N. 150 millicurie
O. Americium-241	O. Foils	O. 1200 millicurie
P. Americium-241	P. Sealed neutron sources	P. 400 millicurie
Q. Californium-252	Q. Sealed sources (Savanna River Model ALC or SALC)	Q. 5 micrograms
R. Plutonium-239	R. Sealed neutron sources in form of PuBe	R. Not to exceed 32 grams encapsulated per source 64 grams total
S. Cesium-137	S. Sealed Sources	S. 600 millicurie total
T. Cesium-137	T. Sealed Sources	T. 50 millicurie total
U. Americium-241	U. Sealed neutron sources	U. 900 millicurie total
V. Cesium-137	V. Sealed Sources (RAMCO-50-ORNL)	V. Not to exceed 420 curies per source and 3000 curies total

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6. Radioactive Material	7. Chemical/Physical Form	8. Maximum Possession Limit
W. Phosphorus-33	W. Any Form	W. 1000 millicurie
X. Radium-226	X. Any Form	X. 10 millicurie
Y. Radium-226	Y. Sealed Sources	Y. 500 millicurie

9. Authorized use:

A. through Y. Research and development as defined in 105 CMR 120.005.

S. For possession and use in AccuRay (Industrial Nucleonics), Kay-Ray, Ohmart, Texas Nuclear or LFE devices which have been evaluated and approved for licensing purposes and authorized for distribution under a license by the U.S. Nuclear Regulatory Commission (USNRC) or an Agreement State.

T. and U. For possession and use in Troxler Electronic Laboratories, Inc., Campbell Pacific Nuclear Corp., Humboldt Scientific, Inc., Seaman Nuclear Corp., or Soiltest, Inc. devices which have been evaluated and approved for licensing purposes under a license issued by the U.S. Nuclear Regulatory Commission or an Agreement State.

V. In Radiation Machinery Company, Gammator 50B irradiators for irradiation of materials except explosive or flammable materials.

CONDITIONS

10. Radioactive materials shall be used at the licensee's facilities located at the University of Massachusetts, Amherst, Massachusetts; Cranberry Station, East Wareham, Massachusetts; Gloucester Marine Station, Gloucester, Massachusetts; Waltham Field Station, Waltham, Massachusetts; Conte Anadromous Fish Research Center, 1 Migratory Way, Turner's Falls, Massachusetts; and Baystate-UMASS Biomedical Research Facility, 3601 Main Street, Springfield, Massachusetts. Licensed material in Items 6.,7.,8., parts P., T., U., may also be used at temporary job sites of the licensee throughout the Commonwealth of Massachusetts.

COMMONWEALTH OF MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH RADIATION CONTROL PROGRAM  MATERIALS LICENSE SUPPLEMENTARY SHEET	LICENSE NUMBER: 60-0107
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11. This license is subject to an annual fee as determined by the Executive Office for Administration and Finance.
12. A. Radioactive material shall only be used by, or under the supervision of, individuals designated by the Radiation Safety Committee, Dr. Joseph Kunkle, Chairperson.  
B. The Radiation Safety Officer for this license is Vincent Chase.
13. In addition to the possession limits in Item 8, the licensee shall restrict the possession of unsealed licensed material to  $10^5$  times the quantity specified in 105 CMR 120.196 Table II and in accordance with the requirements of 105 CMR 120.125(C).
14. In addition to the possession limits in Item 8, the licensee shall further restrict the possession of licensed material at a single location to quantities below the limits specified in 105 CMR 120.196 Table III which require consideration of the need for an emergency plan for responding to a release of licensed material.
15. The licensee shall conduct a physical inventory every six (6) months to account for all sealed sources received and possessed under the license. The records of the inventories shall be maintained until inspection by the Radiation Control Program and shall include the quantities and kinds of radioactive material, location of sealed sources and the date of the inventory.
16. A. Sealed sources and detector cells containing licensed material shall be tested for leakage and/or contamination at intervals not to exceed six months or at such other intervals as are specified by the certificate of registration referred to in 105 CMR 120.128 (N), not to exceed three years.  
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 three months.  
C. In the absence of a certificate from a transferor indicating that a leak test has been made within six months prior to the transfer, a sealed source or detector cell received from another person shall not be put into use until tested.

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- 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.
- E. Sealed sources and detector cells 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 3.7 megabecquerel (100 microcurie) of beta and/or gamma emitting material or not more than 370 kilobecquerel (10 microcurie) 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 transfer 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 test shall be capable of detecting the presence of 185 becquerel (0.005 microcurie) of radioactive material on the test sample. If the test reveals the presence of 185 becquerel (0.005 microcurie) or more of removable contamination, a report shall be filed with the Agency and the source or detector cell shall be removed immediately from service and decontaminated, repaired, or disposed of in accordance with Agency regulations. The report shall be filed within five days of the date the leak test result is known with the Massachusetts Department of Public Health, Attn: Director, Radiation Control Program. The report shall specify the source or detector cell involved, the test results, and corrective action taken.
- G. The licensee is authorized to collect leak test samples for analysis by the licensee. Alternatively, tests for leakage and/or contamination may be performed by persons specifically licensed by the USNRC or an Agreement State to perform such services.

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17. Sealed sources or detector cells containing licensed material shall not be opened or sources removed from source holders by the licensee.
18. 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 temperatures from exceeding that specified in the certificate of registration referred to in 105 CMR 120.128 (N).
  - B. When in use, detector cells containing a titanium tritide foil or a scandium tritide foil shall be vented to the outside.
19. The licensee shall not perform repairs or alterations of the irradiator involving removal of shielding or access to the licensed material. Removal, replacement, and disposal of sealed sources in the irradiator shall be performed by persons specifically licensed by the USNRC or an Agreement State to perform such services.
20. The procedures contained in the manufacturer's instruction manual for the irradiator authorized by this license shall be followed and a copy of this manual shall be made available to each person using or having responsibility for the use of the device.
21. The licensee shall assure that the shutter mechanism of each fixed gauge is locked in the closed position during periods when a portion of an individual's body may be subject to the direct radiation beam. The licensee shall review and modify as appropriate its "lock-out" procedures whenever a new fixed gauge is obtained to incorporate the fixed gauge manufacturer's recommendations.
22. Each fixed gauge shall be tested for the proper operation of the on-off mechanism and indicator, if any, at no longer than six-month intervals or at such longer intervals as specified by the manufacturer and approved by the USNRC or an Agreement State in a registration certificate referred to in 105 CMR 120.128 (N).
23. The licensee shall operate each fixed gauge containing licensed material within the manufacturer's specified temperature and environmental limits such that the shielding and shutter mechanism of the source holder are not compromised.
24. Each portable nuclear 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



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or its container must be locked when in transport, storage or when not under the direct surveillance of an authorized user.

25. Any cleaning, maintenance, or repair of the gauge(s) that requires removal of the source rod shall be performed only by the manufacturer or by other persons specifically licensed by the USNRC or an Agreement State to perform such services.
26. When using the device(s) for testing at field sites the licensee shall have in his/her possession at such locations a current copy of the license, the current leak test certificate(s), the licensee's operating and emergency procedures, and the manufacturer's instruction manual for the sealed sources(s) and device(s).
27. Radioactive waste generated shall be stored in accordance with the statements, representations, and procedures included with the waste storage plan described in the licensee's letter received February 24, 1994.
28. 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. Before disposal as ordinary trash, the waste shall be surveyed at the container surface with the appropriate survey instrument 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.
  - B. A record of each such disposal permitted under this License Condition shall be retained for three years. The record must include the date of disposal, the date on which the byproduct material was placed in storage, the radionuclides disposed, the survey instrument used, the background dose rate, the dose rate measured at the surface of each waste container, and the name of the individual who performed the disposal.
29. The licensee shall only transport radioactive material or deliver radioactive material to a carrier for transport in accordance with the provisions of 49 CFR Parts 170 through 189, 10 CFR Part 71, and 105 CMR 120.770 "Transportation of Radioactive Material."
30. The licensee shall comply with the requirements described in the regulation 105 CMR 120.235(A) & (B), the letter dated December 2, 2005, and the attached document entitled "Increased Controls for Licensees that Possess Sources Containing Radioactive Material

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Quantities of Concern." The licensee shall complete implementation of said requirements within 6 months from the issuance of the license amendment or the first day that radionuclides in quantities of concern are possessed at or above the limits specified in Table 1 of the attachment, whichever is later. Within 21 days after the implementation of the requirements of this condition, the licensee shall notify the Agency in writing that it has completed the requirements of this condition.

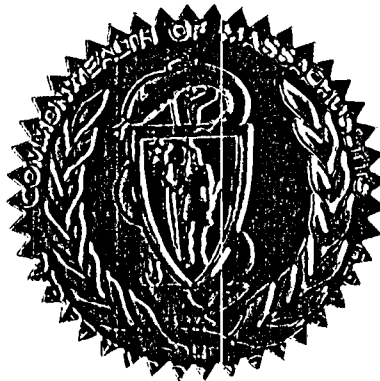
31. Except as specifically provided otherwise by this license, the licensee shall conduct its program in accordance with statements, representations and procedures contained in the documents, including any enclosures listed below. The Massachusetts Regulations for the Control of Radiation, 105 CMR 120.000, shall govern, unless statements, representations and procedures in the licensee's application and correspondence are more restrictive than the regulations.
- A. NARM Application dated November 14, 1995
  - B. Letter dated April 24, 1996
  - C. Letter dated December 27, 1990, with attachments
  - D. Letter dated July 15, 1991, with application dated July 16, 1991
  - E. Letter dated July 3, 1992
  - F. Letter received February 24, 1994
  - G. Letter dated October 18, 1994
  - H. Letter dated April 26, 1996
  - I. USNRC License No. 20-00882-03, Amendment No. 58, transferred to the Agency on March 21, 1997
  - J. Letter dated December 11, 2001
  - K. Letter dated March 1, 2002
  - L. Letter dated December 12, 2003
  - M. Letter dated January 9, 2004
  - N. Letter dated January 30, 2004
  - O. Letter dated February 18, 2004
  - P. Letter dated February 23, 2004
  - Q. Letter dated March 4, 2004
  - R. Letter dated June 7, 2004
  - S. Letter dated January 5, 2005
  - T. Facsimile dated January 25, 2005
  - U. U.S. Nuclear Regulatory Commission letter dated October 4, 2005
  - V. Letter dated December 2, 2005

COMMONWEALTH OF MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH RADIATION CONTROL PROGRAM	LICENSE NUMBER: 60-0107
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	AMENDMENT NUMBER: <u>05</u>

FOR THE COMMONWEALTH OF MASSACHUSETTS  
DEPARTMENT OF PUBLIC HEALTH  
RADIATION CONTROL PROGRAM

Date 12/02/05

By Robert Walker  
Robert Walker, Director



Vincent D. Chase, CHP  
University of Massachusetts Amherst  
Environmental Health and Safety  
40 Campus Center Way  
Amherst, MA 01003  
Phone: 413-545-5153  
Email: vchase@ehs.umass.edu

**Program Head, Radiation Safety Services  
Radiation Safety Officer**

**Summary of Experience**

**HEALTH PHYSICIST:** M.S. in Radiological Health Physics – extensive research experience – 3 years in health physics and reactor operation at a research reactor – 5 years in developing health physics applications and systems for the nuclear industry – recognized as skilled nuclear instrumentation and software engineer – expert in spectrum analysis and internal dose calculation – extensive experience in writing and renewal of federal, state and local licenses and permits.

**MANAGER:** 6 years as project manager of nuclear systems involving hardware/software integration, construction and calibration; directed 5 technicians on over 20 projects. – 12 years in pharmaceutical R&D safety with responsibility for the safe use of benchtop radiation, gamma irradiator facilities, radiosynthesis laboratories, NMR spectrometers, x-ray generating instruments, radioactive waste storage and handling facilities, lasers and fork lifts; directed multiple technical staff at large and geographically separate laboratory sites. – 1 year as head of radiation safety services for land grant university with the responsibility for laboratory radiation safety, radioactive waste storage and handling facilities, gamma irradiator facilities, state emergency management, laser safety, large magnet safety, RF safety and radiographic devices; direct technician pool and staff assistants to cover radiation safety at geographically separate locations, contracted universities and remote government laboratories.

**CONSULTANT:** 18 years consulting in spectral analysis, nuclear instrumentation, regulatory review and applied health physics for public and private institutions, domestic and international.

**PROFESSIONAL ACHIEVEMENTS**

**HEALTH PHYSICS**

- Reactor Operator License, USNRC, 1MW(th) research reactor; 1983.
- Certified by the American Board of Health Physics, Comprehensive; November, 1993.
- Developed specifications and field calibration criteria for an *in vivo* animal counter.
- Wrote criteria, managed D&D and obtained free-release of a pharmaceutical research facility.
- Designed an algorithm for the scaling of low energy gamma nuclides in power plant waste.
- Developed QA and calibration procedures for delayed neutron activation analysis in humans.
- Collaborated in the design of a uranium tritide bed apparatus for a radiosynthesis laboratory.
- Designed a method to measure ventilation filter cartridges using a standard thyroid counter.
- Designed and oversaw construction of decay-in-storage facility for radioactive waste.
- Steering Committee for the formation of the RSO section, Health Physics Society, 1997  
Board of Directors, New England Chapter of the Health Physics Society, 1996 to 1999  
President, New Jersey Chapter of the Health Physics Society, 2001 to 2002

## MANAGER

- Directed the construction and integration of large systems priced from \$500K to over \$1M for Canberra Industries. Reported directly to the Vice-President of Nuclear Products.
- Managed the ionizing and non-ionizing radiation safety programs and other general safety programs for Boehringer Ingelheim. Managed \$75K annual budget. Reported directly to the Director, EA&S.
- Managed the ionizing and non-ionizing radiation safety programs of Wyeth Research at three major biomedical research facilities in three geographically different locations. Managed two technicians and \$230K annual budget. Reported directly to the Director, EH&S.
- Manage the ionizing and non-ionizing radiation safety programs for the University of Massachusetts Amherst. Assign the technical pool and manage two dedicated radiation safety staff. Manage radiation safety services for local colleges and off campus government research laboratories. Manage \$85K annual budget. Report directly to the Director, EH&S.

## CONSULTANT

- Evaluate *in vivo* and *in vitro* bioassay data for nuclear power plants, DOE facilities and biomedical research laboratories to determine internal dose.
- Assess radiation safety program performance for USDOE and USNRC/Agreement State licensees.
- Calibrate and recommend performance criteria for large radiation detection and analysis systems.
- Lecturer at the Harvard School of Public Health. Reviewer for Health Physics Journal.

## EMPLOYMENT HISTORY

<u>University of Massachusetts Amherst</u> , Amherst, MA Program Head, Radiation Safety Services	2004 to Present
<u>Wyeth Research (aka Wyeth Pharmaceuticals)</u> , Princeton, NJ Radiation Safety Officer	1999 to 2004
<u>Boehringer Ingelheim Pharmaceuticals</u> , Ridgefield, CT Radiation Safety Officer	1999 to 1993
<u>Canberra Industries</u> , Meriden, CT Project Manager, Trainer, Consultant and Radiation Safety Officer	1987 to 1993

## EDUCATION

M.S., Radiological Health Physics	University of Lowell, 1988
B.S., Radiological Health Physics, Dean's List Minor in Mathematics, Minor in Physics	University of Lowell, 1985
A.S., Engineering Science, Dean's List	Northern Essex Community College, 1981

## PUBLICATIONS

Chase V., Keep An Eye on This One (A Primer to Laser Safety). Oper. Rad. Safety 76(5):S53.

Linsalata P, Chase V., Wickline R, Petlick S. Radiological Decommissioning for Pharmaceutical Research. Poster, Health Physics Society Mid-Year Meeting, Orlando, FL, 2002.

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This is to acknowledge the receipt of your letter/application dated

2/3/2006, and to inform you that the initial processing which includes an administrative review has been performed.

AMEND. 20-00882-08  
There were no administrative omissions. Your application was assigned to a technical reviewer. Please note that the technical review may identify additional omissions or require additional information.

Please provide to this office within 30 days of your receipt of this card

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A copy of your action has been forwarded to our License Fee & Accounts Receivable Branch, who will contact you separately if there is a fee issue involved.

Your action has been assigned Mail Control Number 138409.  
When calling to inquire about this action, please refer to this control number.  
You may call us on (610) 337-5398, or 337-5260.

NRC FORM 532 (R1)  
(6-96)

Sincerely,  
Licensing Assistance Team Leader