

MATERIALS LICENSE

Amendment No. 08

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, 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.

OFFICIAL RECORD COPY

Licensee		In accordance with the letter dated July 26, 1996, 3. License Number 20-00642-07 is amended in its entirety to read as follows:	
1. Boston College			
2. 140 Commonwealth Avenue Chestnut Hill, Massachusetts 02167		4. Expiration Date March 31, 2003	
		5. Docket or Reference No. 030-17140	
6. Byproduct, Source, and/or Special Nuclear Material	7. Chemical and/or Physical Form	8. Maximum Amount that Licensee May Possess at Any One Time Under This License	
A. Any byproduct material with Atomic Numbers 3 through 83	A. Any	A. Not to exceed 50 millicuries per radionuclide, and 1250 millicuries total	
B. Hydrogen 3	B. Any	B. 1 curie	
C. Hydrogen 3	C. Accelerator targets	C. 20 curies	
D. Carbon 14	D. Any	D. 250 millicuries	
E. Carbon 14	E. Self-luminous light source	E. 20 millicuries	
F. Phosphorus 32	F. Any	F. 150 millicuries	
G. Phosphorus 33	G. Any	G. 150 millicuries	
H. Sulfur 35	H. Any	H. 100 millicuries	
I. Molybdenum 99	I. Any	I. 200 millicuries	
J. Technetium 99	J. Any	J. 250 millicuries	
K. Technetium 99m	K. Any	K. 200 millicuries	
L. Iodine 125	L. Foil	L. 10 millicuries	
M. Polonium 210	M. Any	M. 100 microcuries	
N. Plutonium 239	N. Encapsulated as Pu-Be neutron source	N. 48 grams	
O. Plutonium 239	O. Plated alpha sources	O. 0.05 microcuries	
P. Americium 241	P. Plated alpha sources	P. 2.2 microcuries	
Q. Californium 252	Q. Foil	Q. 65 millicuries	

9. Authorized use

A. through Q. Research and development as defined in 10 CFR 30.4; animal studies.

CONDITIONS

10. Licensed material may be used only at the licensee's facilities at Boston College, Chestnut Hill, Massachusetts.

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SUPPLEMENTARY SHEET**

License Number

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11. A. Licensed material shall be used by, or under the supervision of individuals designated in writing by the Radiation Safety Committee, Rudi Hon, Ph.D., Chairperson. The licensee shall maintain records of individuals designated as users.
- B. The Radiation Safety Officer for this license is Thomas P. Fuller.
12. In addition to the possession limits in Item 8, the licensee shall further restrict possession of unsealed byproduct material of half-life greater than 120 days in the following manner: If only one such isotope is possessed, the quantity possessed will be maintained at a quantity less than or equal to 100,000 times the applicable quantity in Appendix C to 10 CFR 20. For a combination of such isotopes, R, defined as the sum of the ratios of the quantity of each isotope possessed to the applicable quantity in Appendix C to 10 CFR 20, divided by 100,000 will be less than or equal to one.
13. 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.
14. Experimental animals, or the products from experimental animals that have been administered licensed materials shall not be used for human consumption.
15. The licensee shall not acquire licensed material in a sealed source or in a device that contains a sealed source unless the source or device has been registered with the Nuclear Regulatory Commission under 10 CFR 32.210 or with an Agreement State.
16. The licensee shall conduct a physical inventory every 6 months to account for all sources and/or devices received and possessed under the license. Records of inventories shall be maintained for 5 years from the date of each inventory.
17. Sealed sources or detector cells containing licensed material shall not be opened or sources removed from source holders or detector cells by the licensee.
18. 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 10 CFR 32.210, 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.
- 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.

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- 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 100 microcuries of beta and/or gamma emitting material or not more than 10 microcuries 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 0.005 microcurie of radioactive material on the test sample. If the test reveals the presence of 0.005 microcurie or more of removable contamination, a report shall be filed with the U.S. Nuclear Regulatory Commission and the source or detector cell shall be removed immediately from service and decontaminated, repaired, or disposed of in accordance with Commission regulations. The report shall be filed within five days of the date the leak test result is known with the U.S. Nuclear Regulatory Commission, Region I, ATTN: Chief, Nuclear Materials Safety Branch, 475 Allendale Road, King of Prussia, Pennsylvania 19406. 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 Commission or an Agreement State to perform such services.
19. 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 10 CFR 32.210.
- B. When in use, detector cells containing a titanium tritide foil or a scandium tritide foil shall be vented to the outside.
20. 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.
21. The licensee may transport licensed material in accordance with the provisions of 10 CFR 71, "Packaging and Transportation of Radioactive Material."

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22. The licensee is authorized to hold radioactive material with a physical half-life of less than 65 days and sulfur 35 for decay-in-storage before disposal in ordinary trash, provided:
- A. Waste to be disposed of in this manner shall be held for decay a minimum of ten half-lives.
 - B. 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.
 - C. 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.
23. 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 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 October 25, 1990
 - B. Letter dated March 18, 1992
 - C. Letter dated July 8, 1992
 - D. Letter dated September 1, 1992
 - E. Letter dated September 14, 1992
 - F. Letter dated February 24, 1993
 - G. Letter dated June 2, 1993

For the U.S. Nuclear Regulatory Commission

Original Signed By:

John D. Kinneman

Date SEP 10 1996

By

Nuclear Materials Safety Branch
Region I

King of Prussia, Pennsylvania 19406

SEP 10 1996

Suzanne Howard, Director
Environmental Health and Safety
Boston College
140 Commonwealth Avenue
Chestnut Hill, MA 02167-3862

Dear Ms. Howard:

This refers to your license amendment request. Enclosed with this letter is the amended license. Please note that as part of this amendment, in accordance with 10 CFR 30.36, effective February 15, 1996, the expiration date of your license has been extended by a period of five years. The new expiration date is stated in Item 4 of the license.

Your amended license has been written in a new format that incorporates current regulatory requirements and NRC policy. Because radioactive waste disposal sites are available at the present time, Condition 22 of your license (Amendment No. 07) is not necessary and has been deleted from your amended license. However, should such sites become unavailable to you in the future, you will be required to resubmit your interim waste storage plan. Please review the enclosed document carefully and be sure that you understand and fully implement all the conditions incorporated into the amended license. If there are any errors or questions, please notify the U.S. Nuclear Regulatory Commission, Region I Office, Licensing Assistance Team, (610) 337-5093 or 5239, so that we can provide appropriate corrections and answers.

Thank you for your cooperation.

Sincerely,

ORIGINAL SIGNED BY:

John D. Kinneman, Chief
Nuclear Materials Safety Branch 2
Division of Nuclear Materials Safety

License No. 20-00642-07
Docket No. 030-17140
Control No. 123552

Enclosure:
Amendment No. 08

DOCUMENT NAME: R:\WPS\MLTR\L2000642.07X

To receive a copy of this document, indicate in the box: "C" = Copy w/o attach/encl "E" = Copy w/ attach/encl "N" = No copy

OFFICE	DNMS/RI	N	DNMS/RI				
NAME	Modhi		Kinneman				
DATE	09/09/96		09/9/96		09/ /96		09/ /96

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BOSTON COLLEGE

OFFICE OF ENVIRONMENTAL HEALTH AND SAFETY

030-17140

July 26, 1996

John Kinneman
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA
09406

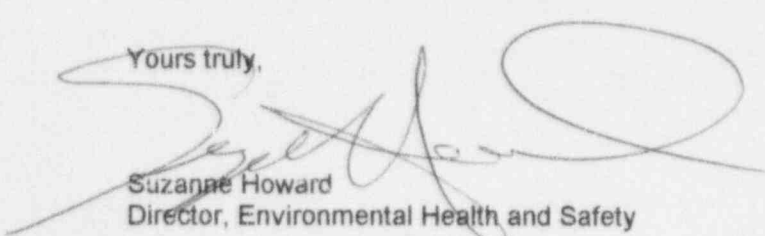
Re: License No. 20-00642-07
Reference No. 030-17140

Dear Mr. Kinneman,

Boston College is putting forth a request to the U.S. Nuclear Regulatory Commission to amend the above referenced license. The current Radiation Safety Officer, Dr. Michael J. Clarke, has asked to be relieved of his responsibilities due to other professional commitments at the College. The BC Radiation Safety Committee has elected to replace Professor Clarke with Thomas P. Fuller as the Radiation Safety Officer. Mr. Fuller has been employed by Boston College as the Associate Radiation Safety Officer for the past two years and we believe he is well qualified for the position. An updated copy of his resume is provided for your consideration.

Expeditious review and approval of this request would be greatly appreciated. Please feel free to call me at (617)552-0303 if you have any questions.

Yours truly,


Suzanne Howard
Director, Environmental Health and Safety

cc: M. Clarke

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123552

REC'D IN LAS AUG - 9 1996

HIGHLIGHTS OF QUALIFICATIONS

- Radiological Health Physicist with over 15 years experience in radiation protection, environmental engineering, site assessment, quality assurance, and occupational safety.
- Experienced in coordination of activities between public and private organizations.
- Comprehensive procedure and program development abilities.
- Broad experience in worker protection and chemical hygiene.

EDUCATION

- **Master of Business Administration**, Suffolk University, Boston, MA, 1989
- **Master of Science in Public Health**, University of North Carolina, Chapel Hill, NC, 1979 (Department of Environmental Science and Engineering, Radiological Hygiene Section)
- **Bachelor of Science**, Ohio State Univ., Allied Medical Professions, Columbus, OH, 1977
- Boston University, courses in Environmental Risk Assessment and Toxicology, 1992
- University of Massachusetts, courses in cleaner production, occupational safety, and ergonomics, 1995

PROFESSIONAL EXPERIENCE

- 1994 - present **Boston College**, Office of Environmental Health and Safety, Boston, MA
Associate Radiation Safety Officer/Chemical Hygiene Officer

- Responsible for all campus radiation protection activities including approval of radioisotope use, surveillance of activities in which radionuclides are used, supervision of radioactive waste disposal, and oversight of personnel dosimetry programs.
- Supervises chemical hygiene programs and implements laboratory safety programs.

- 1991 - 1996 **Massachusetts Institute of Technology**, Cambridge, MA
Assistant Radiation Protection Officer, Environmental Medical Service

- Developed and implemented health physics programs for sealed and unsealed sources at the Whitehead Institute biology laboratories and the MIT Plasma Fusion Center.
- Ensured center compliance with NRC, DOE and OSHA for radiation protection, environmental effluents, ALARA, and Environmental Health and Safety.
- Developed and implemented programs for control and surveillance of non-ionizing sources of radiation including lasers, microwaves, and magnets.
- Trained and supervised personnel in radiation protection and laser safety.
- Performed technical consulting to nuclear utilities in emergency preparedness, environmental monitoring, quality assurance and radiation protection.
- Supervised radiation protection technicians in laboratory surveillance and analysis.
- Represented the Radiation Protection Office on the Plasma Fusion Center Safety Committee.

1991 - present **Massasoit Community College and Northeastern University, MA**
Faculty, Radiologic Technology

- Teaches college courses in Radiation Protection, Radiobiology, Diagnostic Quality Control, and Radiographic Photography.

1990 - 1991 **United Energy Services Corporation, Marietta, GA**
Supervising Engineer, Nuclear Safety and Licensing Division

- Coordinated division activities, business plan development, scheduling and proposal preparation.
- Supervised teams conducting environmental, radiation protection, and emergency preparedness audits and program reviews at nuclear power stations (North Anna, Surry, Millstone, Haddam Neck, Gentilly, and Palo Verde).
- Marketed company support services.

1982 - 1990 **Yankee Atomic Electric Company, Bolton, MA**
Lead Auditor, Quality Assurance Department

- Managed in-plant and vendor audit teams.
- Audited areas of environmental science, chemistry, radiation protection, radwaste, and training at nuclear power plants (Yankee, Vermont Yankee, Seabrook, and Maine Yankee).

Senior Engineer, Environmental Engineering Department

- Supervised the activities of emergency exercise scenario development teams and task forces.
- Coordinated emergency exercise activities with federal, state, and local governments.
- Provided ongoing support in emergency plan and procedure development.
- Tracked and resolved regulatory inspection items.

1979 - 1982 **Stone and Webster Engineering Corporation, Boston, MA**
Assistant Project Engineer/Environmental Health Physicist, Nuclear Technology

- Coordinated radiological emergency plan development and training.
- Completed environmental reports and calculations for nuclear power plant effluents.
- Developed Standard Operating Procedures for environmental field monitoring and sample collection and performed correlations to offsite dose rates from nuclear plant releases.

1979 **Sargent and Lundy Engineers, Chicago, IL**
Health Physicist, Nuclear Safeguards and Licensing

- Performed health physics analysis of nuclear power station design.
- Managed thermoluminescent dosimetry and exposure control for radiological workers.

1978 **Oak Ridge National Laboratories, Oak Ridge, TN**
Research Assistant, Health and Safety Research Division

- Performed environmental sampling of atmosphere and biota.
- Completed research in worker protective clothing and ventilation equipment.

AFFILIATIONS

Health Physics Society
New England Chapter Health Physics Society - past Treasurer
American Nuclear Society
American Registry of Radiologic Technologists
American Industrial Hygiene Association

PUBLICATIONS

Fiore, C.L., T.P. Fuller, R.L. Boivan, R.S. Granetz, Radiation Measurements from Alcator C-Mod Initial Operation, paper presented to the 15th IEEE/NPSS Symposium on Fusion Engineering, Hyannis, Massachusetts, 1993. 0-7803-1412 (1994) IEEE.

Barbanel, Cheryl S., A.M. Ducatman, M.J. Garston, T.P. Fuller, Laser Hazards In Research Laboratories, Journal of Occupational Medicine, Volume 35, Number 4, April 1993.

Fiore, C.L., R. Boivan, R.S. Granetz, T. Fuller, and C. Kurz, Status of the Neutron Diagnostic Experiment for Alcator C-Mod, Rev. Sci. Instrum. 63 (10), October 1992.

Fuller, T.P., C.E. Fiore, Alcator C-Mod Safety and Radiation Program, paper presented to the 14th IEEE/NPSS Symposium on Fusion Engineering, San Diego (1991).

Fuller, T.P., A Symptom Based Approach to Emergency Classification At Seabrook Station, paper presented to the 30th Annual Meeting of the Health Physics Society, Chicago (1985).

Fuller, T.P., Stone and Webster Engineering Corporation, Protective Ventilation Suits, paper presented to the 26th Annual Meeting of the Health Physics Society, Louisville (1981).

Fuller, T.P., C.E. Easterly, Tritium Protective Clothing, ORNL/TM-6671, ORNL (1979).

References provided upon request.

BETWEEN:

LICENSE FEE MANAGEMENT BRANCH, ARM
AND
REGIONAL LICENSING SECTIONS

(FOR LFMS USE)
INFORMATION FROM LTS

: PROGRAM CODE: 01100
: STATUS CODE: 0
: FEE CATEGORY: EX 3L 1D
: EXP. DATE: 20030331
: FEE COMMENTS: 170.11(A)(4) 3/10/88
: DECOM FIN ASSUR REQD: Y
:

LICENSE FEE TRANSMITTAL

A. REGION I

1. APPLICATION ATTACHED

APPLICANT/LICENSEE: BOSTON COLLEGE
RECEIVED DATE: 960809
DOCKET NO: 3017140
CONTROL NO.: 123552
LICENSE NO.: 20-00642-07
ACTION TYPE: AMENDMENT

2. FEE ATTACHED

AMOUNT: -----
CHECK NO.: -----

3. COMMENTS

SIGNED
DATE

M.A. Perkins
8/10/96

B. LICENSE FEE MANAGEMENT BRANCH (CHECK WHEN MILESTONE 03 IS ENTERED 1)

1. FEE CATEGORY AND AMOUNT: EX 3L 1D 170.11(A)(4)

2. CORRECT FEE PAID. APPLICATION MAY BE PROCESSED FOR:

AMENDMENT -----
RENEWAL -----
LICENSE -----

3. OTHER -----

SIGNED
DATE

1996 AUG 14 PM 3:35

RECEIVED BY LFDCB
<u>Aug 9</u>
<u>BB</u>
<u>8/15/96</u>

07 for 8/15/96