

MATERIALS LICENSE

Amendment No. 59

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, 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.

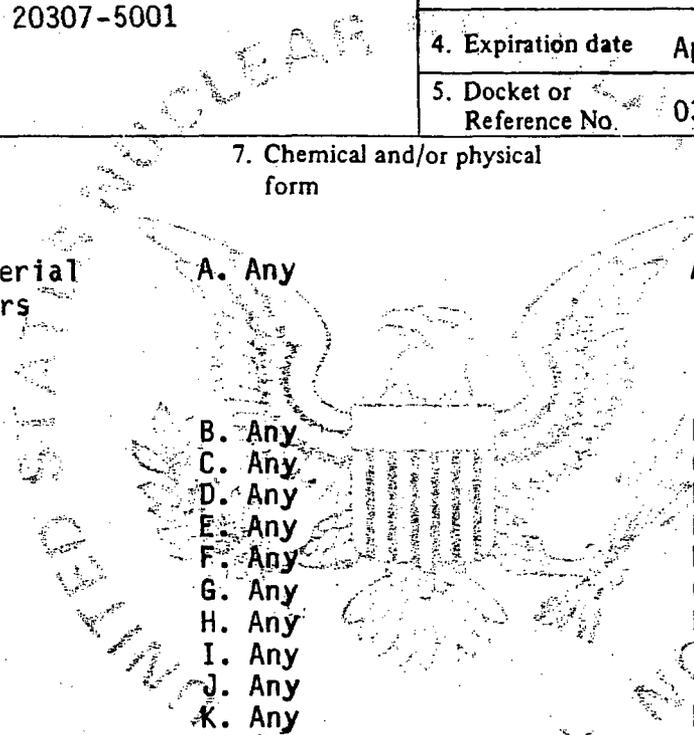
Licensee

- 1. Department of the Army
Walter Reed Army Medical Center (WRAMC)
- 2. Washington, D.C. 20307-5001

In accordance with letter dated July 16, 1990,
3. License number 08-01738-02 is amended in its entirety to read as follows:

- 4. Expiration date April 30, 1993
- 5. Docket or Reference No. 030-01317

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 1-83	A. Any	A. 400 millicuries of each radionuclide with a total possession limit of 26 curies
B. Iodine 131	B. Any	B. 2 curies
C. Xenon 133	C. Any	C. 2 curies
D. Krypton 85	D. Any	D. 1 curie
E. Gold 198	E. Any	E. 1 curie
F. Phosphorus 32	F. Any	F. 2 curies
G. Carbon 14	G. Any	G. 2 curies
H. Iodine 125	H. Any	H. 1 curie
I. Iridium 192	I. Any	I. 1 curie
J. Chromium 51	J. Any	J. 750 millicuries
K. Sulfur 35	K. Any	K. 1 curie
L. Hydrogen 3	L. Any	L. 5 curies
M. Molybdenum 99	M. Molybdenum 99/ Technetium 99m Generators	M. 23 curies
N. Technetium 99m	N. Any	N. 23 curies
O. Strontium 90	O. Sealed sources	O. 500 millicuries
P. Cesium 137	P. Sealed sources	P. <input type="checkbox"/>
Q. Gadolinium 153	Q. Sealed sources	Q. <input type="checkbox"/>
R. Iodine 125	R. Sealed sources (Norland Inst. Co., Model 178A591A)	R. 400 millicuries
S. Iodine 125	S. Sealed sources (3M Company seeds)	S. 500 millicuries
T. Iodine 125	T. Sealed sources (AECL Models C235 or C324, or Amersham Corp Model IMC.P2)	T. 4 sources, not to exceed 300 millicuries each
U. Cesium 137	U. Sealed sources	U. <input type="checkbox"/>
V. Cobalt 60	V. Sealed sources	V. <input type="checkbox"/>



Information in this record was deleted in accordance with the Freedom of Information Act, exemptions 2 + 6

FOIA 2006-0238

Handwritten mark resembling a stylized '2' or 'Q2'.

Handwritten initials 'KK/12' and other scribbles.

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License number

08-01738-02

Docket or Reference number

030-01317

Amendment No. 59

(Items 6., 7. & 8. continued)

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

W. Americium 241
X. Americium 241

W. Any
X. Sealed source

W.
X.

Y. Nickel 63
Z. Iodine 129

Y. Sealed sources and foils
Z. Sealed sources

Y. 1 curie
Z. 1 curie

AA. Thorium
BB. Uranium
CC. Uranium depleted in Uranium 235

AA. Any
BB. Any
CC. Plated Metal

AA. 5 kilograms
BB. 50 kilograms
CC. 400 kilograms

DD. Americium 241
EE. Cesium 137

DD. Sealed sources
EE. Sealed source

DD.
EE.

FF. Cesium 137

FF.

FF.

9. Authorized use

A. through T. Medical research, diagnosis, and therapy; research and development as defined in 10 CFR 30.4.

U. through Z. Research and development as defined in 10 CFR 30.4; teaching.

AA. and BB. Teaching and laboratory research.

CC. Shielding

DD. Standards and reference sources.

EE. In an for calibration of instruments.

FF. Instrument calibration.

CONDITIONS

10. Location of use:

Walter Reed Army Medical Center, Washington, D. C.; WRAMC Forest Glen Section and Annex, Silver Spring, Maryland; U.S. Army Medical Research Institute for Infectious Diseases, Fort Detrick, Frederick, Maryland; Andrew Rader Army Clinic, Fort Myer, Virginia; Walter Reed Army Institute of Research Animal Holding Facility, Fort Meade, Maryland; U.S. Army Medical Laboratory, WRAMC Department of Pathology, Fort Meade, Maryland; and U.S. Army Institute of Dental Research Facility, Fort Meade, Maryland; Rickman Building, 13 Taft Court, Rockville, Maryland; Key West Research Center, 9620 Medical Center Drive, Rockville, Maryland.

11. Radiation Safety Officer: LTC Peter H. Myers.

Information in this record was deleted in accordance with the Freedom of Information Act exemptions 2, 2025-0238

Ex 2

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License number

08-01738-02

Docket or Reference number

030-01317

Amendment No. 59

(Continued)

CONDITIONS

12. A. Licensed material shall be used by, or under the supervision of, individuals designated by the licensee's Radiation Safety Committee, Col. Russ Zajtchuk, Chairman.
- B. The use of licensed material in or on humans shall be by a physician as defined in Section 35.2 of 10 CFR Part 35.
- C. Physicians designated to use licensed material in or on humans shall meet the training criteria established in 10 CFR Part 35, Subpart J.
13. Experimental animals administered licensed materials or their products shall not be used for human consumption.
14. In lieu of using the conventional radiation caution colors (magenta or purple on yellow background) as provided in Section 20.203(a)(1), of 10 CFR Part 20, the licensee is hereby authorized to label detector cells and cell baths, containing licensed material and used in gas chromatography devices, with conspicuously etched or stamped radiation caution symbols without a color requirement.
15. Detector cells containing titanium tritide foil shall only be used in conjunction with a properly operating temperature control mechanism which prevents foil temperatures from exceeding 225 degrees Centigrade.
16. Detector cells containing scandium tritide foil shall only be used in conjunction with a properly operating temperature control mechanism which prevents foil temperatures from exceeding 325 degrees Centigrade.
17. Notwithstanding the requirements of 10 CFR 35.49 (a) and (b), the licensee may use for medical use any byproduct material or reagent kit for which the Food and Drug Administration has accepted a "Notice of Claimed Investigational Exemption for a New Drug" (IND).
18. The licensee may transport licensed material in accordance with the provisions of 10 CFR Part 71, "Packaging and Transportation of Radioactive Material".
19. If only a single radionuclide specified in NUREG 0767, is possessed, the possession limit is the quantity specified in Schedule of Limiting Possession Limits, NUREG-0767. If two or more radionuclides are possessed, the possession limit for each is determined as follows: the sum of the quotients of the quantities possessed divided by the quantities of those radionuclides specified in the Schedule of Limiting Possession Limits, NUREG-0767 shall not exceed unity.
20. The licensee is authorized to hold radioactive material with a physical half-life of less than 90 days for decay-in-storage before disposal in ordinary trash provided:
 - A. Radioactive waste to be disposed of in this manner shall be held for decay a minimum of 10 half-lives.

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License number

08-01738-02

Docket or Reference number

030-01317

Amendment No. 58

(20. continued)

CONDITIONS

- B. Before disposal as normal waste, radioactive waste shall be surveyed to determine that its radioactivity cannot be distinguished from background. All radiation labels shall be removed or obliterated.
 - C. Generator columns shall be segregated so that they may be monitored separately to ensure decay to background levels prior to disposal.
21. 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 July 18, 1979
 - B. Letter dated January 13, 1984
 - C. Letter dated May 8, 1987
 - D. Letter dated March 16, 1988
 - E. Letter dated March 28, 1988
 - F. Application dated August 5, 1988
 - G. Letter dated September 23, 1988
 - H. Letter dated July 28, 1989
 - I. Letter dated September 12, 1989
 - J. Letter dated January 19, 1990
 - K. Letter dated July 16, 1990
 - L. Letter dated March 15, 1991

For the U.S. Nuclear Regulatory Commission

Original Signed By:

By Judith A. Joustra

Nuclear Materials Safety Branch
Region I

King of Prussia, Pennsylvania 19406

Date APR 30 1991

APR 30 1991

License No. 08-01738-02
Docket No. 030-01317
Control No. 112925

Department of the Army
Walter Reed Army Medical Center (WRAMC)
ATTN: Lt. Col. Llewellyn E. Piper
Executive Officer
Washington, DC 20307-5001

Gentlemen:

Please find enclosed an amendment to your NRC Material License.

Please review the enclosed document carefully and be sure that you understand all conditions. If there are any errors or questions, please notify the Region I Material Licensing Section, (215) 337-5093, so that we can provide appropriate corrections and answers.

Please be advised that you must conduct your program involving licensed radioactive materials in accordance with the conditions of your NRC license, representations made in your license application, and NRC regulations. In particular, please note the items in the enclosed, "Requirements for Materials Licensees."

Since serious consequences to employees and the public can result from failure to comply with NRC requirements, the NRC expects licensees to pay meticulous attention to detail and to achieve the high standard of compliance which the NRC expects of its licensees.

You will be periodically inspected by NRC. A fee may be charged for inspections in accordance with 10 CFR Part 170. Failure to conduct your program safely and in accordance with NRC regulations, license conditions, and representations made in your license application and supplemental correspondence with NRC will result in prompt and vigorous enforcement action against you. This could include issuance of a notice of violation, or in case of serious violations, an imposition of a civil penalty or an order suspending, modifying or revoking your license as specified in the General Policy and Procedures for NRC Enforcement Actions, 10 CFR Part 2, Appendix C.

We wish you success in operating a safe and effective licensed program.

Sincerely,

Original Signed By:
Judith A. Joustra

Judith A. Joustra
Nuclear Materials Safety Section D
Division of Radiation Safety
and Safeguards

Enclosures:

1. Amendment No. 59
2. Requirements for Materials Licensees

DRSS:RI
Joustra/ss

04/29/91



REPLY TO
ATTENTION OF:

DEPARTMENT OF THE ARMY
WALTER REED ARMY MEDICAL CENTER
WASHINGTON, D.C. 20307-5001



HSHL-H-HP (385-11m)

15 March 1991

MEMORANDUM FOR US Nuclear Regulatory Commission, Region I,
Nuclear Material Safety Section A, 475
Allendale Road, King of Prussia, PA 19406

SUBJECT: Amendment of US Nuclear Regulatory Commission License
No. 08-01738-02. Additional information requested Docket No.
030-01317, Control No. 112925.

This is in reference to your request in a letter dated February 5, 1991 for additional information on our decay-in-storage program. The following information is provided in response to those questions.

1. The existing program for research waste with half-lives of 65 days or less generates 50-60 55gal. drums of compacted trash per year. The expected increase with half-lives of 90 days or less could raise the total to 60-75 drums per year. We currently hold this waste for 24 months to ensure at least 10 half-lives for the longest isotopes, which means we have between 100 and 120 drums in storage at any one time. Holding all our short half-life waste for 30 months could mean up to 185 drums in storage at any one time.
2. Enclosure 1 is a copy of one of the "Terms and Conditions" which all users of radioactive material at Walter Reed most follow. All the solid radioactive waste at Walter Reed is collected, screened, and packaged by the Health Physics Office. Bags of waste are examined by the health physics personnel when they are collected and again when they are compacted to ensure the proper segregation and defacing of any radioactive labels has occurred.
3. When the solid, short half-life, radioactive material is compacted it is in a 55 gal. steel drum (DOT 17H). The drum is sealed shut, the out side is marked with an I.D. number with an indelible marker, and the following information is recorded; the drum I.D., all isotopes in the drum and the initial activity of each, the date the drum was closed. When this drum is ready for disposal it is re-entered in a local disposal log and data base which includes; I.D. number, date closed, date disposed, survey instrument model, serial number and calibration date, background

OFFICIAL RECORD COPY ML 10

112925
MAR 25 1991

HSHL-H-HP (385-11m)

SUBJECT: Amendment of US Nuclear Regulatory Commission License No. 08-01738-02. Additional information requested Docket No. 030-01317, Control No. 112925.

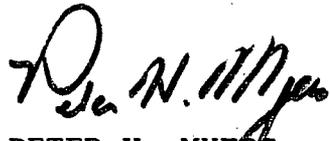
readings, maximum readings of waste, and initials of person performing survey and waste disposal.

4. When the waste has been held for decay for at least 10 half-lives of the longest half-life material present, the drums are moved to a low background area and surveyed with a portable survey meter with a remote GM or scintillation probe. If no readings above background are found the drums are opened and the material is surveyed again as it is removed from the drum. Currently we are using a Ludlum model 2 with a GM probe which is calibrated in mr/hr. The normal background is approximately 0.05 mr/hr which is 10% of full scale on the lowest scale. If I-125 is the major remaining contaminate a low energy gamma scintillation probe may also be used to ensure no external radiation levels above background are present. The waste when originally packaged contains at most a few millicuries of activity, after at least 10 half-lives it contains at most a few microcuries of activity and no measurable external exposure. In addition this waste will continue to decay in a land fill at the rate of at least 4 half-lives per year making the likelihood of any internal deposition remote. Any biological waste held for decay will be incinerated at the conclusion of the decay period which will preclude the ingestion of this material.

5. The medical waste in question will be compacted into 55 gal. steel drums as outlined in question 3's response.

6. The waste storage facility at WRAMC is a decommissioned research reactor facility. This building is constructed of concrete, concrete block and brick, it has no windows and very little flammable material involved in it's construction. This building is dry and heated and has a maximum capacity to hold two or three times the amount of waste we will be holding when this amendment is granted. This building is under the sole control of the Health Physics Office with steel doors and double locks at all entrances.

1 Encl


PETER H. MYERS
LTC, MS
Health Physics Officer

HEALTH PHYSICS
WALTER REED ARMY MEDICAL CENTER
Washington, D.C. 20307-5001

CONDITION NO. 4

For

RADIOACTIVE MATERIAL AUTHORIZATIONS

RADIOACTIVE WASTE

1. General. Radioactive waste from Walter Reed Army Medical Center and tenant activities will be controlled, packaged, transported, and disposed of in accordance with AR 385-11, "Ionizing Radiation Protection;" Title 10, Code of Federal Regulations; Title 49, Code of Federal Regulations; Nuclear Regulatory Commission Licenses issued to WRAMC; applicable provisions of State Government requirements for waste disposal sites located within their jurisdiction; and the guidelines delineated herein.

2. Definitions:

a. Radioactive Material: Any material or combination of materials that spontaneously emits gamma rays, X-rays, alpha particles, beta particles, neutrons, or other atomic particles that are capable of producing ions, directly or indirectly by their passage through matter.

b. Radioactive Waste: Surplus items containing radioactive material, property contaminated with radioactive material to the extent that decontamination is economically unsound, and materials that have become contaminated during possession/use of radioactive material.

c. Activity: The number of nuclear transitions (disintegrations) occurring in a given quantity of material per unit time (disintegrations per second); expressed in units of Curies or Becquerels.

d. Specific Activity: Total activity of a given radionuclide per gram of a compound, element, or radioactive nuclide.

e. Curie: The special unit of activity. One curie equals 3.700×10^{10} nuclear transitions per second. (Abbreviated Ci.). Several fractions of the curie are in common usage:

(1) Microcurie: One-millionth of a curie (3.7×10^4 disintegrations per sec.). Abbreviated μCi .

(2) Millicurie: One-thousandth of a curie (3.7×10^7 disintegrations per sec.). Abbreviated mCi.

REVISION 2, effective 13 Apr 87

Encl 1

CONDITION NO. 4 FOR RADIOACTIVE MATERIAL AUTHORIZATIONS (RADIOACTIVE WASTE)

- (12) Animal Carcasses/Animal Waste: Short half-life.
- (13) Animal Carcasses/Animal Waste: Long half-life.
- (14) Animal Carcasses: ≤ 0.05 Microcuries H-3 or C-14 per gram of animal tissue averaged over the entire weight of the animal.
- (15) Gas, Combustible.
- (16) Gas, Non-combustible.

b. Limiting the non-radioactive waste which is intermixed with radioactive waste to an absolute minimum.

c. Removing or obliterating all "Radioactive Material" labels on non-radioactive vendor shipping packages and on short half-life radioactive waste. Uncontaminated vendor shipping containers may be disposed of in the normal trash by the users. Short half-life waste will be delivered to Health Physics Office (HPO) collection points for subsequent storage, decay, and ultimate disposal in the normal trash when HPO personnel have determined that the waste has reached natural background radiation levels.

d. Storing used Mo-99/Tc-99m generators and other items of equipment containing radioactive material in designated areas only. The radiation labels will be removed on such items only when they reach background radiation levels.

e. Maintaining their inventory of radioactive waste to a practical minimum.

f. Controlling radioactive waste in their work areas to prevent unauthorized disposal by the custodial service. Magenta plastic bags will be used to contain radioactive waste. Magenta bags will not be used for other purposes.

g. Insuring that all radioactive waste is delivered to HPO collection point personnel for ultimate disposal.

h. Marking all radioactive waste containers with the radiation caution symbol and the words "Caution - Radioactive Waste" and/or "Caution -Radioactive Material." Plus "DO NOT EMPTY!"

i. Insuring that radioactive material is not released into the sanitary sewage system without the specific approval of the Health Physics Officer.

j. Insuring that decontamination of reusable equipment is only performed in laboratory sinks that have been authorized via their Radioactive Material Authorization. See Section II for specific requirements concerning this procedure.

CONDITION NO. 4 FOR RADIOACTIVE MATERIAL AUTHORIZATIONS (RADIOACTIVE WASTE)

i. Biological wastes (e.g., animal carcasses/animal waste) shall be prepared by the User in a manner that allows the waste to be readily packed in in a 30-gallon drum alternating 10-inch layers of waste and packing materials. Prepared biological waste shall be placed in double magenta plastic bags and tagged as previously indicated.

SECTION II - RELEASE OF RADIOACTIVITY INTO THE SANITARY
SEWAGE SYSTEM

1. Liquid waste will be released to the sanitary sewage system in accordance with Title 10, Code of Federal Regulations, Chapter 1, Part 20.303 (i.e., 10 CFR 20).

2. Unless specifically authorized by the Health Physics Office, all releases of radioactive liquid to the sanitary sewerage system will be conducted by the Health Physics Office to assure that the quantity of radioactive material released into the system by combined WRAMC disposal procedures does not exceed the following limits:

a. The quantity of any licensed or other radioactive material released into the system by WRAMC in any one day does not exceed the larger of paragraphs a(1) or (2) below.

(1) The quantity which, if diluted by the average daily quantity of sewage released into the sewer by WRAMC will result in an average concentration equal to the limits specified in Appendix B, Table I, Column 2 of 10 CFR 20 or

(2) Ten times the quantity of such material specified in Appendix C of 10 CFR 20 and

b. The quantity of any licensed or other radioactive material released in any one month, if diluted by the average monthly quantity of water released by WRAMC, will not result in an average concentration exceeding the limits specified in Appendix B, Table I, Column 2 of 10 CFR 20 and

c. The gross quantity of licensed and other radioactive material, excluding hydrogen-3 and carbon-14, released into the sewerage system by WRAMC does not exceed one curie per year. The quantities of hydrogen-3 and carbon-14 released into the sanitary sewerage system may not exceed 5 curies per year for hydrogen-3 and 1 curie per year for carbon-14. Excreta from individuals undergoing medical diagnosis or therapy with radioactive material shall be exempt from any limitations contained in this document.

3. The following policy and procedures apply to all individuals permitted to release radioactive washings into the sanitary sewage system via laboratory sinks:

a. Such release approval must be specifically included in the Principal User's WRAMC Radioactive Material Authorization.

CONDITION NO. 4 FOR RADIOACTIVE MATERIAL AUTHORIZATION (RADIOACTIVE WASTE)

SECTION IV - RADIOACTIVE WASTE DISPOSAL SUPPLIES

1. Items of supply for the containment and packaging of radioactive waste are stocked by the Supply and Administration Branch, Materiel Division, Directorate of Industrial Operations, WRAMC. The stockage items meet U.S. Army and Federal radioactive material packaging requirements for most of the radioactive waste resulting from laboratory and/or clinic procedures at WRAMC, WRAIR and AFIP. However, it should be noted that packaging requirements vary with the particular type, form and curie amount of the radioactive waste. Consequently, all personnel involved with the packaging of radioactive waste should consult the Health Physics Office in order to assure that the available stockage items meet packaging specification requirements for each particular radioactive waste disposal operation.
2. Following are the currently stocked items:
 - a. DRUM, Steel, DOT Specification 17-H, 30-gallon with gasket and sealing bolt. (Used as shipping container for the transport of radioactive biologicals).
 - b. DRUM, Steel, DOT Specification 17-H, 55-gallon with gasket and sealing bolt. (Used as a shipping container for the transport of low-level radioactive materials).
 - c. VERMICULITE, 4 cu ft bags. (Used as an absorbent material for the packaging of biological and liquid radioactive waste) - agricultural, Grade 4.
 - d. SLAKED LIME (Used to retard spoilage of biological radioactive waste).
 - e. BAG, Plastic, Magenta, 20" x 15" x 60", 4 mil thickness. (Used as a liner for large waste receptacle).
 - f. BAG, Plastic, Magenta, 13" x 12" x 24", 2 mil thickness. (Used as a liner for small laboratory radioactive waste receptacle).
 - g. DIATOMACEOUS EARTH, medium grade (floor dry #85), 2.5 cu ft bag. (Used as an absorbent material for packaging of liquid radioactive waste).
3. Additional items will be stocked or procured as required to meet the provisions of Federal/State regulatory agencies.
4. Principal Users are responsible for funding the costs of materials and supplies used to dispose of radioactive wastes. Although Principal Users will pay for the supplies they stock for use in their particular areas, the Health Physics Office, RMC Branch, will order and pick up the supplies needed to collect and package the radioactive waste received from the Principal Users. All orders placed by the Health Physics Office for radioactive waste disposal supplies for the hospital, WRAIR and AFIP will be funded by Clinical Investigation, Department of Pathology/Laboratory Services, Department of Radiology, WRAIR, or AFIP as appropriate.

FEB 05 1991

License No. 08-01738-02
Docket No. 030-01317
Control No. 112925

Department of the Army
Walter Reed Army Medical Center
ATTN: Lt. Col. Llewellyn E. Piper,
Executive Officer
Washington, DC 20307-5001

Gentlemen:

This is in reference to your request in a letter dated July 11, 1990, to amend License No. 08-01738-02. In order to continue our review, we need the following additional information:

Item 2 of your letter requests that your license be amended in order to change your decay-in-storage program. In reference to that request please address the following questions.

1. Please submit an estimation of the volume of contaminated waste to be produced.
2. Provide a copy of instructions which will be provided to employees concerning the segregation of radioactive waste. Your instructions must be adequate to assure that waste is properly labelled or identified, especially with regard to isotope.
3. Please provide a description of the records that will be maintained and labelling that will be used to track and identify the waste.
4. Describe the instrumentation and the monitoring procedure you will use to determine that the waste is free of radioactive contamination at the end of the storage period. Please include the minimal detectable activity (MDA) which will be achieved.
5. Describe the containers in which the waste will be stored and show that they are appropriate to the waste form anticipated and are likely to survive the proposed storage interval.
6. Describe the storage facility, including security and fire protection features. Show that the facility is large enough to hold the expected volume of waste, and adequate to protect the waste containers from deterioration due to environmental conditions.

We will continue our review upon receipt of this information. Please reply in duplicate to my attention at the Region I office and refer to Mail Control No. 112925.

OFFICIAL RECORD COPY

ML 037 JOUSTRA - 0001.0.0
01/31/91

ML 10

If we do not receive a reply from you within 30 calendar days from the date of this letter, we shall assume that you do not wish to pursue your application.

Sincerely,

**Original Signed By:
Judith A. Joustra**

Judith A. Joustra
Nuclear Materials Safety Section A
Division of Radiation Safety
and Safeguards

RI:DRSS SAB
Joustra/vhd

1/5/91
2

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ML 037 JOUSTRA - 0002.0.0
01/31/91



DEPARTMENT OF THE ARMY
OFFICE OF THE SURGEON GENERAL
5109 LEESBURG PIKE
FALLS CHURCH, VA 22041-3258

030-01317



REPLY TO
ATTENTION OF

July 16, 1990

Preventive and Military
Medicine Consultants Division

US Nuclear Regulatory Commission
Region I
475 Allendale
King of Prussia, Pennsylvania 19406

Dear Sir:

Enclosed are two copies of a request to amend Byproduct
Material License Number 08-01738-02, Walter Reed Army Medical
Center, Washington, DC.

Recommend approval.

Sincerely,

Charles E. Day, III
Lieutenant Colonel, U.S. Army
Radiological Hygiene Consultant

Enclosure

FEE EXEMPT

OFFICIAL RECORD COPY 10

112925

JUL 19 1990



DEPARTMENT OF THE ARMY
WALTER REED ARMY MEDICAL CENTER
WASHINGTON, D.C. 20307-5001

REPLY TO
ATTENTION OF:

18 JUN 1990

HSHL-H-HP (385-11m)

MEMORANDUM THRU

~~Commander, US Army Health Services Command, ATTN: HSEL-P, Fort
Sam Houston, TX 78234-6000~~

*Robert Myers
LTC MS
5 Jul 90*

HQDA (SGPS-PSP-E), 5109 Leesburg Pike, Falls Church, VA 22041-3258

FOR US Nuclear Regulatory Commission, Region I, Nuclear Material
Safety Section A, 475 Allendale Road, King of Prussia, PA
19406

SUBJECT: Amendment of US Nuclear Regulatory Commission License
No. 08-01738-02

1. Request that NRC License No. 08-01738-02 for Walter Reed Army Medical Center be amended to reflect a change in the Radiation Safety Officer from 1Lt. Allen W. Anthony to LTC Peter H. Myers. LTC Myers has been assigned as the Chief, Health Physics Office at Walter Reed AMC since August 1989. A Training and Experience Form and a Curriculum Vitae for LTC Myers are enclosed (Enclosures 1 and 2).
2. Request that Walter Reed's license also be amended to allow the holding for decay of radioactive waste containing isotopes with half lives up to ninety (90) days. We have been decaying waste with half lives of sixty five (65) days or less for a few years and have a good program for segregating, packaging, storing, and disposing of this material. We have the space to hold material for three (3) years instead of the current twenty two (22) months. Some protocols at Walter Reed use P-32 and S-35 in the same labs or even the same experiments, requiring that all the waste be packaged for burial because of the S-35 half life. Some animal studies use three (3) or four (4) different microspheres to measure blood flow at different time points in an experiment, Cr-51, Ru-103, and Ce-141 (all with half

FEE EXEMPT

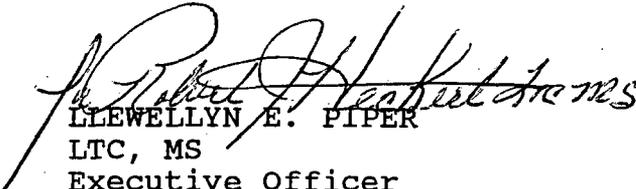
HSHL-H-HP

SUBJECT: Amendment of US Nuclear Regulatory Commission License
No. 08-01738-02

lives of less than sixty five (65) days) may be used with Sc-46 so all the waste has to be packaged for burial. This amendment would reduce our solid waste volume to the burial ground by 10-20%.

FOR THE COMMANDER:

2 Encls


LLEWELLYN E. PIPER
LTC, MS
Executive Officer

6. EXPERIENCE WITH RADIATION (Actual use of Radioisotopes) (Sealed or unsealed source)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
Pu-239 Ar-241 Cs-137 Sr-90 Co-60		Enewetok Atoll Radiological Clean-up	1 year	Environmental Clean-up Project Debris & Soil
I-131 Ir-192 Cs-137	400 mCi	WRAMC WRAMC WRAMC	10 months 10 months 10 months	Radiotherapy Radiotherapy Radiotherapy

7. EXPERIENCE WITH RADIATION PRODUCING DEVICES (X-ray, Irradiators, etc.)

DEVICE	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
GE Maximar 250-III Deep Therapy X-ray Unit	Texas A&M University	2 years	Research Pro-
Research/Teaching Nuclear Reactor	Texas A&M University	1 year	General Radiation Program OJT — (1) Waste Management (2) Env Monitoring (3) Dosimetry (4) Isotope Manufacture for use in Research

8. CERTIFICATION:

I certify that the information provided hereon is true and complete to the best of my knowledge.

25 May 91

(Date Signed)

Peter N. Meyer

(Signature of Applicant)

CURRICULUM VITAE

for

PETER HALL MYERS, Lieutenant Colonel

DATE AND PLACE OF BIRTH: [

YEARS OF ACTIVE MILITARY SERVICE: Over 22 years

PRESENT ASSIGNMENT: (3 Aug 89 to present)

Chief, Health Physics Office; Alternate RPO,
Walter Reed Army Medical Center,
Washington, DC 20307-5001

MILITARY EDUCATION (pertinent to radiation protection):

1. Senior Officers' Nuclear Accident Course,
3 1/2 days (8 hours related to 10CFR35.900), 24-27 Apr 78
InterService Nuclear Weapons School
Kirtland Air Force Base, New Mexico

(included presentations on basic radiation protection principals used in managing nuclear weapons accidents, e.g., characteristics of radiological materials to be encountered, contamination monitoring and identification, hot line operations)

2. Nuclear Medical Science Officers Workshop
1 week (11 hours related to 10CFR35.900), 19-23 Oct 81
U.S. Army Environmental Hygiene Agency
Aberdeen Proving Ground, Maryland

(included presentations on management of radiation protection programs and topical radiation protection issues)

3. Nuclear Weapons Orientation Advanced Course
1 week (2 hours related to 10CFR35.900), 1-5 Mar 82
InterService Nuclear Weapons School
Kirtland Air Force Base, New Mexico

4. Medical Effects of Nuclear Weapons Course,
1 week (17 hours related to 10CFR35.900), 28 Feb-4 Mar 83
Armed Forces Radiobiology Research Institute
Bethesda, Maryland

(included presentations on predicted human response to both high and low doses of ionizing radiation; receipt and processing (by medical treatment facilities) of patients contaminated by nuclear material; and basic and advanced medical techniques for the management and treatment of patients having received ionizing radiation exposures)

Ex 2

Encl 2

Curriculum Vitae, LTC Peter H. Myers
(continued)

MILITARY EDUCATION (continued):

5. U.S. Army Medical Department Radiation Health Sciences Course
1 week (16 hours related to 10CFR35.900), 24-28 Oct 88
U.S. Army Environmental Hygiene Agency
Aberdeen Proving Ground, Maryland

(included presentations on management of radiation protection programs and topical radiation protection issues)

CIVILIAN EDUCATION (relative to radiation protection):

1. Applied Health Physics Course
5 weeks (200 hours related to 10CFR35.900), 30 May-1 Jul 77
Oak Ridge Associated Universities
Oak Ridge, Tennessee
2. Graduate Study leading to Master of Science Degree in
Biophysics (emphasis in Health Physics)
2 years, Jul 79-Jun 81 (52 Semester Hours)
Texas A&M University
College Station, Texas

(see attachment 7 for course curriculum)

(see attachment 8 for details of courses taken)

(included one-year of practical experience (4-8 hours a week) working with Texas A&M's Dosimetry Program, Cyclotron and Research Reactor's Radiation Protection Programs, Radioactive Waste Management Program, Environmental (air, water and soil) Monitoring Program)

3. ABHP Certification Examination Preparation Course
21 Weeks (57 hours related to 10CFR35.900), 11 Jan-31 May 90
Baltimore-Washington Chapter, Health Physics Society
(Classes at NRC Headquarters, Rockville, MD)

(see attachment 9 for details of course curriculum)

HEALTH PHYSICS EXPERIENCE:

1. Instructor, Radiation Protection
July 1977 - April 1978
Radiological/Chemical Protection Branch
Academy of Health Sciences
Fort Sam Houston, Texas

(included preparing and presenting classes on Battlefield

Curriculum Vitae, LTC Peter H. Myers
(continued)

HEALTH PHYSICS EXPERIENCE (continued);

Nuclear Radiation Protection to Army Medical Department Officers; classes included characteristics of ionizing radiation (alpha, beta and gamma), monitoring for ionizing radiation contamination, decontamination procedures and principles of radiation protection (time, distance and shielding)

2. Assistant Radiation Protection Officer
2 May 1978 - 1 May 1979
Joint Task Group
Enewetak Atoll Cleanup Project
Enewetak Atoll,
Trust Territories of the Pacific Islands

(included assisting the RPO in the preparation and execution of all radiation protection policies in support of the three-year multi-Agency project to remove debris and radiologically-contaminated soil from the islands of Enewetak Atoll; part of the Atomic weapons Pacific Test Site, 1948 - 1958. Radionuclides encountered included those typical to nuclear weapons detonations: Plutonium-239, Americium-241, Cesium-137, Strontium-90, Cobalt-60. Significant radiation protection programs involved: personnel dosimetry, personnel and equipment contamination control, hot-line operations, and air sampling.)

3. Course Director, Medical Effects of Nuclear Weapons Course
6 March 1984 - 6 January 1986
Armed Forces Radiobiology Research Institute
National Naval Medical Center
Bethesda, MD

(included presentations on predicted human response to both high and low doses of ionizing radiation; receipt and processing (by medical treatment facilities) of patients contaminated by nuclear material; and basic and advanced medical techniques for the management and treatment of patients having received ionizing radiation exposures)

4. Nuclear, Biological, Chemical Staff Officer
January 1986 - July 1987
Office of The Surgeon General
Headquarters, Department of the Army
Washington, DC

(included sponsoring and staying abreast of latest research on medical treatment of ionizing radiation exposure patients; of specific interest was the development of radioprotectants and medicaments to maintain effective performance during times

Curriculum Vitae, LTC Peter H. Myers
(continued)

HEALTH PHYSICS EXPERIENCE (continued):

when early radiation sickness ordinarily would interfere with performance effectiveness -- also included development of procedures to be used by battlefield medical units to maximize effectiveness within environments affected by nuclear weapons detonations, e.g., unit preparation in anticipation of nuclear weapons detonations (shielding from prompt ionizing radiation exposures) and unit procedures subsequent to nuclear weapons detonations (shielding from residual radiation exposures and prevention of residual radiation contamination.)

5. Commander
14 July 1987 - 13 July 1989
US Army Pacific Environmental Health Engineering Agency
Camp Zama, Japan

(included directly supervising Health Physics Division whose responsibility was to perform surveys of Tripler Army Medical Center's (TAMC's) Radiation Protection Program which, in part, supported their Nuclear Medicine Clinic -- direct supervision involved reviewing and approving all survey reports written in evaluation of TAMC's Radiation Protection Program.)

UNITED STATES AIR FORCE



Certifies that

CPT PETER H. MYERS

Ex 6

has successfully completed the

SENIOR OFFICERS NUCLEAR ACCIDENT COURSE (G302P0513-1)

KIRTLAND AIR FORCE BASE, NEW MEXICO 87117

PDS CODE: NPR DURATION: 34 DAYS

and is herewith awarded this

CERTIFICATE of TRAINING

Butler T. Franklin

BUTLER T. FRANKLIN, Lt Col, USAF

Commandant

Interservice Nuclear Weapons School



24 - 27 Apr 1978

Date



DEPARTMENT OF THE ARMY
CERTIFICATE OF TRAINING

This is to certify that

MAJ PETER H. MYERS

has successfully completed

NUCLEAR MEDICAL SCIENCE OFFICERS WORKSHOP
19 - 23 OCT 81

Given at US Army Environmental Hygiene Agency

Charles E. Day, III

CHARLES E. DAY, III
MAJ, MSC
Course Director

NUCLEAR MEDICAL SCIENCE OFFICERS' CONFERENCE

18 October 1981

Sunday

0001-2400

Sign-in & Register

SDO & SDNCO

19 October 1981

Monday

<u>TIME</u>	<u>TITLE</u>	<u>INSTRUCTOR</u>
0815-0830	In-processing	Mrs. Donley
0830-0845	Welcome	COL Whitlaw
0845-0900	Course Introduction	MAJ Day
0910-0950	Orientation/Task Assignments	MAJ Day/CPT Vreuls
1000-1100	Nuclear Medical Science Officers in the Army	COL McDermott
1110-1200	MSC Affairs LUNCH	BG Jordan
1300-1330	Litigation of Speaking Out(JAG)	MAJ Reilly
1335-1425	Radiological Technician(91P)	1LT Watts
1435-1525	Health Physics Technician(91M)	CPT Harrison
1535-1600	Naval Health Physics	CDR Beuchler
1605-1630	Air Force Health Physics	LTC Kopp

20 October 1981

Tuesday

0800-1630	201/Branch File Review with Personnel Interview	COL McDermott
0800-0850	Rad Contaminated Patients Physician's Perspectives	LTC Spebar
0850-0900	Class Photo	CPT Tupin
0900-0950	WRAMC-RAMT	MAJ Mathewson
1000-1050	NUWAX-8J	CPT(P) Connock
1100-1150	Nuc Med Sci Officers in the Field LUNCH	
1300-1330	AFFRI Orientation	COL Adcock/MAJ Hagai
1335-1425	Non-Ionizing Rad: What's New	LMD (TBA)
1435-1525	INRAD	MAJ Potter
1535-1625	Internal Dosimetry	MAJ(P) Williams

21 October 1981

Wednesday

<u>TIME</u>	<u>TITLE</u>	<u>INSTRUCTOR</u>
0800-0850	Rad Waste Management at a MEDCEN	CPT Cherry
0900-0950	Rad Waste Management in the Army	Byron Morris
1000-1050	Air Gap Technique	MAJ Day
1100-1150	HSC in Perspective	LTC Field
	LUNCH	
1300-1330	Army Nuclear Chemical Agency Orientation	MAJ Myers
1335-1425	Dosimetry: Estimated Fetal Exposure Utilizing Radiographs	MAJ Wright
1435-1625	Instrument and Monitoring Methods for Health Physicists	CPT Cherry

22 October 1981

Thursday

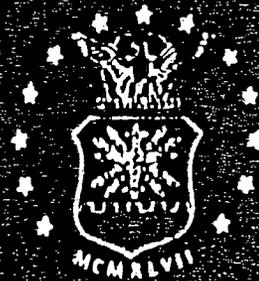
0800-0850	American Society of Radiological Technologist	Ms Dorothy Foutf
0900-0950	Society of Nuclear Medicine	Dr. Hendee
1000-1050	Nuclear Regulatory Commission	Mrs. P. Vacca
1100-1150	Bureau of Radiological Health	John Villforth
	LUNCH	
1300-1330	DARCOM Orientation	MAJ Gaston
1335-1425	American Association of Physicists in Medicine	Dr. Wright
1435-1525	Health Physics Society	Mr. Holeman
1535-1625	National Committee on Radiation Protection	Dr. Taylor
1800-1900	Banquet	
1900-2000	Eat	
2000-	Dr. Hendee	

23 October 1981

Friday

0800-1030	Discussion of Tasks	MAJ Day
1040-1120	Open Discussion	All Students
1130-1145	Critique	All Students
1150-1215	Summary & Closing Remarks	MAJ Day
	LUNCH	
1315-1630	Out-Processing	SM
	Sign-Out	SDO & SDNCO

THE UNITED STATES AIR FORCE



WALTER E. ...

has successfully completed the

NUCLEAR WEAPONS ORIENTATION ADVANCED COURSE (G302P4054)

KIRTLAND AIR FORCE BASE, NEW MEXICO 87117

PDS CODE: EHX

DURATION: 1 1/2 DAYS

and is herewith awarded this

CERTIFICATE of TRAINING

Francis M. Gullick

FRANCIS M. GULLICK, Lt Col, USAF
Commander
Interservice Nuclear Weapons School



1-5 Mar 82

Date

Armed Forces Radiobiology Research Institute
Defense Nuclear Agency

Certificate of Completion

This is to certify that

MAJ Peter H. Myers, MSC, USA

has completed 29 hours of



**MEDICAL EFFECTS OF
NUCLEAR WEAPONS**



a Course for Military Physicians
given at the Armed Forces Radiobiology Research Institute,
Bethesda, Maryland.

4 March 1983

DATE

BOBBY R. ADCOCK
Colonel, MSC, USA
Director, AFRRRI

As an organization accredited for continuing medical education, the Naval Health Sciences Education and Training Command designates this continuing medical activity as meeting the criteria for 29 credit hours in Category I of the Physician's Recognition Award of the American Medical Association.

CONTENTS

Welcome and Introduction	A
History of Nuclear Weapons	B
The Threat and U.S. Concept of Nuclear War	C
<u>Physical Principles of Nuclear Weapons</u>	D
Blast and Thermal Effects of Nuclear Weapons	E
<u>Physical Principles of Ionizing Radiation Effects</u>	F
<u>Cellular Radiation Biology</u>	G
<u>Effects of Ionizing Radiation on Organ Function</u>	H
<u>Performance Decrement Caused by Ionizing Radiation</u>	I
<u>The Acute Radiation Syndrome: Diagnosis and Treatment</u>	J
<u>Nuclear Weapon Fallout</u>	K
Nuclear Warfare Reporting: Tactical and Strategic	L
<u>Medical Operations in Nuclear War</u>	M
Impact of Electromagnetic Radiation	N
<u>Biomedical Effects of Nonionizing Radiation</u>	O
<u>Human Experience in Radiation Injury</u>	P
<u>Nuclear Weapons Accidents</u>	Q
Nuclear Emergency Search Team (NEST)	R
<u>Radiation-Detecting Devices</u>	S
<u>Current and Future Directions in Radiobiology Research</u>	T
<u>Long-Term Effects of Ionizing Radiation</u>	U
<u>Radiation Sources: Principles and Operations</u>	V
Potential Hazards of Chemical Agents on the Nuclear Battlefield	W
<u>Detection and Decontamination of Radiation Casualties</u>	X
<u>Radiation Exposure: Values and Risks</u>	Y



DEPARTMENT OF THE ARMY
CERTIFICATE OF TRAINING

This is to certify that

LTC PETER H. MYERS

has successfully completed

THE ARMY MEDICAL DEPARTMENT
RADIATION HEALTH SCIENCES COURSE
24-28 Oct 88

Given by: U.S. Army Environmental
Hygiene Agency

Arthur B. Webb

Arthur B. Webb
LTC, MS
DRES

OAK RIDGE ASSOCIATED UNIVERSITIES

This is to certify that

PETER H. MYERS

has completed

A FIVE-WEEK APPLIED HEALTH PHYSICS COURSE

conducted by Special Training Division of
Oak Ridge Associated Universities
Operating under contract with the
Energy Research and Development Administration

1st day of JULY, 1977

at Oak Ridge, Tennessee


Chairman, Special Training Division

APPLIED HEALTH PHYSICS

May 30 - June 3, 1977

FIRST WEEK

DATE	TIME	TOPIC	LECTURER	R
Monday, May 30	8:00 AM	Welcome, Registration, Orientation	Beck/Kent	
	9:00 AM	ATOMIC AND NUCLEAR STRUCTURE	PAULSON	
	11:00 AM	Math Review	Beck	
	1:00 PM	INTRODUCTION TO RADIOACTIVITY	PAULSON	
	2:30	COMPUTER ORIENTATION	GLEASON	
Tuesday, May 31	8:00 AM	MODES AND RATES OF DECAY	PAULSON	
	9:30 AM	Lab: Computational Techniques	Beck	
	10:30 AM	COUNTING STATISTICS	GLEASON	
	1:00 PM	PARTICLE INTERACTIONS	PAULSON	
	2:30 PM	GAS DETECTORS: G-M COUNTERS	BECK	
	3:30 PM	Lab: HP-1 Laboratory Techniques	Kent/Auxier	
Wednesday, June 1	8:00 AM	GAMMA INTERACTIONS	PAULSON	
	9:30 AM	Lab: HP-2 G-M Counting	Auxier/Beck	
	1:00 PM	GAS DETECTORS: PROPORTIONAL COUNTERS	KENT	
	2:30 PM	Lab: HP-3 Beta Characteristics	Auxier/Paulson	
Thursday, June 2	8:00 AM	QUANTITIES AND UNITS I	BECK	
	9:30 AM	Review & Problem Session	Kent	
	10:30 AM	GAS DETECTORS: IONIZATION CHAMBERS	KENT	
	1:00 PM	SCINTILLATION SPECTROMETRY I	GLEASON	
	2:30 PM	Lab: HP-8 Proportional Counting	Beck/Kent	
Friday, June 3	8:00 AM	QUANTITIES AND UNITS II	BECK	
	9:30 AM	Review and Quiz	Beck/Kent	
	10:30 AM	SCINTILLATION SPECTROMETRY II	GLEASON	
	1:00 PM	BIOLOGY REVIEW	GIST	
	2:30 PM	Lab: HP-5 Gamma Ray Spectrometry	Gleason	

Attachment 7

APPLIED HEALTH PHYSICS

June 5 - 10, 1977

SECOND WEEK

DATE	TIME	TOPIC	LECTURER	
Monday, June 6	8:00 AM	SCINTILLATION SPECTROMETRY III	GLEASON	
	9:30 AM	Lab: HP-6 Multichannel Analyzer	Paulson/Gleason	
	1:00 PM	RADIATION BIOLOGY I	CLOUTIER	
	2:30 PM	Lab: HP-45 Bio. Effects of Radiation	Gist/Auxier	
Tuesday, June 7	8:00 AM	LIQUID SCINTILLATION COUNTERS	GIST	
	9:30 AM	Lab: HP-20 Liquid Scintillation Counters	Gist/Kent	
	1:00 PM	RADIATION BIOLOGY II	CLOUTIER	
	2:30 PM	RADIATION PROTECTION GUIDES I	BECK	
Wednesday, June 8	8:00 AM	X-RAY PRODUCTION AND CHARACTERISTICS	CLOUTIER	I
	9:30 AM	Review and Problem Session	Kent	I
	10:30 AM	SHIELDING I	BECK	I
	1:00 PM	SHIELDING II	KENT	I
	2:30 PM	Lab: HP-18 Shielding	Kent/Beck	V
Thursday, June 9	8:00 AM	RADIATION PROTECTION GUIDES II	BECK	F
	9:30 AM	ACUTE EFFECTS OF RADIATION	ANDREWS	F
	10:45 AM	Shielding Evaluation Problem	Kent	F
	1:00 PM	IONIZATION SURVEY INSTRUMENTS	KENT	E
	2:30 PM	Lab: HP-13 Ionization Survey Meter Characteristics	Beck/Kent	E
	Friday, June 10	8:00 AM	GEIGER-MUELLER SURVEY INSTRUMENTS	BECK
9:00 AM		Lab: HP-21 Condenser R Meter	Beck/Kent	M
11:00 AM		Review and Quiz	Beck/Kent	E
1:00 PM		SOURCES OF HEALTH PHYSICS INFORMATION	BECK	E
2:00 PM		Lab: HP-14 G-M Survey Instruments	Beck/Kent	E

APPLIED HEALTH PHYSICS

June 13 - 17, 1977

THIRD WEEK

DATE	TIME	TOPIC	LECTURER	ROOM
Monday, June 13	8:00 AM	SPECIAL SURVEY INSTRUMENTS	KENT	E-4
	9:00 AM	Lab: (A) γ Scintillation Instruments (B) α Instruments	Beck Kent	E-4 E-4
	11:00 AM	NEUTRON PRODUCTION	PAULSON	E-4
	1:00 PM	NEUTRON INTERACTIONS AND DETECTION	PAULSON	E-4
	2:30 PM	Lab: (B) γ Scintillation Instruments (A) α Instruments	Beck Kent	E-4 E-4
	Tuesday, June 14	8:00 AM	STANDARDIZATION	GLEASON
9:30 AM		Lab: HP-35 Standardization	Gleason	W-14
1:00 PM		NEUTRON SURVEY INSTRUMENTS		E-4
2:30 PM		Lab: (A) HP-15 BF_3 Detectors (B) HP-16 Neutron Survey Instruments	Beck Kent	W-15 E.B.
Wednesday, June 15	8:00 AM	FACILITY DESIGN		E-4
	9:30 AM	Review and Problem Session	Kent	E-4
	11:00 AM	NEUTRON SHIELDING		E-4
	1:00 PM	FILM DOSIMETRY	KENT	E-4
	2:30 PM	Lab: (B) HP-15 BF_3 Detectors (A) HP-16 Neutron Survey Instruments	Beck Kent	W-15 E.B.
Thursday, June 16	8:00 AM	THERMOLUMINESCENT DOSIMETRY	BECK	E-4
	9:30 AM	Lab: (A) HP-25 Thermoluminescent Dosimetry (B) HP-22 Film Dosimetry	Beck Kent	W-1 W-14
	1:00 PM	INTERNAL DOSIMETRY I	CLOUTIER	E-4
	2:30 PM	Lab: (B) HP-25 Thermoluminescent Dosimetry (A) HP-22 Film Dosimetry	Beck Kent	W-1 W-14
	Friday, June 17	8:00 AM	INTERNAL DOSIMETRY II	CLOUTIER
9:30 AM		Review and Quiz	Beck/Kent	E-4
11:00 AM		INTERNAL DOSIMETRY III	CLOUTIER	E-4
1:00 PM		TRITIUM HAZARDS	GIST	E-4
2:30 PM		Lab: Internal Dosimetry	Cloutier/Kent	E-4

APPLIED HEALTH PHYSICS

June 20 - 24, 1977

FOURTH WEEK

DATE	TIME	TOPIC	LECTURER	ROOM
Monday, June 20	8:00 AM	RADIATION ACCIDENTS	LUSHBAUGH	E-4
	9:00 AM	PROTECTIVE CLOTHING AND RESPIRATORS	BERGER	E-4
	10:30 AM	Lab: Protective Clothing & Respirators	Berger/Beck	E.B
	1:00 PM	BIOASSAY AND WHOLE-BODY COUNTING	CLOUTIER	E-4
	3:00 PM	Lab: HP-32 Bioassay	Beck/Kent	W-1
Tuesday, June 21	8:00 AM	ELEMENTS OF EMERGENCY PLANNING	SMALLEY	E-4
	9:30 AM	MEDICAL ASPECTS OF INTERNAL CONTAMINATION		E-4
	10:30 AM	ACCIDENT DOSIMETRY	BECK	E-4
	1:00 PM	EMERGENCY PROCEDURES	BECK	E-4
	2:30 PM	Lab: Accident Dosimetry	Beck/Kent	W-1
Wednesday, June 22	8:00 AM	ADVANCED ABSOLUTE COUNTING	GLEASON	E-4
	9:30 AM	Review and Problem Session	Kent	E-4
	11:00 AM	SEMICONDUCTOR DETECTORS	KENT	E-4
	1:00 PM	PARTICLE SPECTROSCOPY	KENT	E-4
	2:30 PM	Lab: (A) HP-28 Particle Spectroscopy (B) HP-38 Advanced Absolute Counting	Kent/Paulson Gleason	W-1 W-1
Thursday, June 23	8:00 AM	AIR SAMPLING AND ANALYSIS		E-4
	9:30 AM	Lab: (B) HP-28 Particle Spectroscopy (A) HP-38 Advanced Absolute Counting	Kent/Paulson Gleason	W-1 W-1
	1:00 PM	NEUTRON ACTIVATION ANALYSIS	GLEASON	E-4
	2:30 PM	Lab: (A) HP-36 Air Sampling (B) HP-42 Neutron Activation Analysis	Kent/Beck Paulson/Gleason	W-1 E.E
	Friday,	8:00 AM	ENVIRONMENTAL MONITORING	GIST
9:30 AM		Review and Quiz	Beck/Kent	E-4
11:00 AM		CRITICALITY AND FISSION	CLOUTIER	E-4
1:00 PM		DECONTAMINATION	KENT	E-4
2:30 PM		Lab: (A) HP-42 Neutron Activation Analysis (B) HP-36 Air Sampling	Gleason/Paulson Beck/Kent	E.E W-1

APPLIED HEALTH PHYSICS

June 27 - July 1, 1977

FIFTH WEEK

DATE	TIME	TOPIC	LECTURER	P
Monday, June 27	3:00 AM	WATER SAMPLING AND ANALYSIS		E
	9:30 AM	Lab: (B) Decontamination	Beck/Kent	W
	1:00 PM	CONTAMINATION & SMEAR SURVEYS	BERGER	E
	2:30 PM	Lab: (A) HP-33 Decontamination (B) HP-37 Water Analysis	Beck/Kent Kent/Beck	W W
Tuesday, June 28	8:00 AM	LOW LEVEL COUNTING	GLEASON	E
	9:30 AM	Lab: HP-12 Low Level Counting	Gleason/Paulson	W
	1:00 PM	CRITICALITY SAFETY		E
	2:30 PM	Lab: Practice Survey	Beck/Kent	E
Wednesday, June 29	8:00 AM	WASTE DISPOSAL	BERGER	E
	9:30 AM	Review and Problem Session	Kent	E
	11:00 AM	X-RAY FLUORESCENCE	PAULSON	E
	1:00 PM	TRANSPORTATION		E
	2:30 PM	Lab: (A) HP-47 X-Ray Fluorescence	Paulson/Gleason	E
Thursday, June 30	8:00 AM	SEALED SOURCE DESIGN AND TESTING	BERGER	E
	9:30 AM	LICENSING REGULATIONS	BECK/BERGER Cloutier/Kent	E
	1:00 PM	PUBLIC INFORMATION	ALEXANDER	E
	2:00 PM	Field Exercise	Beck/Kent	E
Friday, July 1	8:00 AM	Critique	Beck/Kent	E
	9:00 AM	Final Exam	Beck/Kent	E
	10:00 AM	HEALTH PHYSICS CHALLENGES	CLOUTIER	E
	11:00 AM	Commencement	Beck/Kent	E
	12:00 N	END OF COURSE		

1990 HEALTH PHYSICS CERTIFICATION EXAMINATION PREPARATION COURSE

Preliminary Schedule

Date	Topic	Assignment
Jan 11	<u>Introduction to the Course</u> Charlie Willis, Director, 301-492-1091 Joel Rabovsky, Co-director, 202-602-1223	None
Jan 18	<u>Radioactivity & Decay</u> Charlie Willis, NRC	Cember Chapter 4 Prob. 1, 2, 4, 5, 6, & 15; Exam 28: #10
Jan 25	<u>Interaction With Matter</u> James Rogers, GU, 202-687-2173	Cember Chapter 5 Probs 1, 3, 19-21, 25, 28, 36
Feb 1	<u>External Radiation Dosimetry</u> Charlie Willis	Cember Chapter 6 Prob. 1-6, 13-15
Feb 8	<u>Shielding</u> Francis M. Roddy, Bechtel 301-258-3097	Cember Chapter 10 Ex 28 #4; Ex 29 #5 Probs. 1, 2, 3, 5, 6, 8, 13, 16
Feb 15	<u>Internal Dosimetry</u> Allen Brodsky, 301-840-5443	Cember Chapter 8 Ex 28: 3, 5; Ex 29 9
Feb 22	<u>Bioassay</u> Allen Brodsky	Handouts
Mar 1	<u>TLD & Film Dosimetry</u> Eric E. Kearsley, 301-295-5414	Cember, pp 257-262 Exam 28: 11 & 13
Mar 8	<u>Instrumentation & Spectroscopy</u> Timothy Osborn, ESA, 301-498-1514	Cember Chapter 9 Problems 12-20
Mar 15	<u>Biological Effects of Radiation</u> Kenneth Mossman, GU, 202-653-5505	Cember Ch 7 & NCRP 91 Exam 29: 1 & 6
Mar 22	<u>Criticality</u> Charlie Willis	Cember Chapter 12 Problems: all Ch. 12
Mar 29	<u>Environmental Health Physics</u> Harold Paterson, NRC, 301-492-3640	Cember pp 339-352 Ex 28 8, 14 Ex 29 7
Apr 5	Break: Chapter Meeting Recommended	
Apr 12	<u>Industrial Radiography</u> Steve McGuire, NRC, 301-492-3757 <u>Statistics</u> Warren Keene, CU, 202-635-5206	NUREG/BR-0024 Cember pp 282-290 Problems 2, 3, 5, 7
Apr 19	<u>Transportation</u> Alfred Grella, NRC, 301-492-3381	Handouts

Apr 26 Medical Health Physics
Coleman Rosen, Fairfax, 703-698-3705

May 3 Reactor Health Physics, Handouts
John Serabian, CIA, Exam 29: #3

May 10 Radon NCRP 78
Robert Watters, ENRAD, 301-948-8040
Accelerator Health Physics NCRP-51 & Patterson
Lester A. Slaback, NIST, 975-5810 & Thomas, "Accelerator
HP," Chapter 4

May 17 Beta Dosimetry Handouts
Sidney Porter, Porter Cons., 215-896-5353

May 24 Uranium Fuel Cycle Handouts
Frank Congel, NRC, 301-492-1091 Exam 29: #8

May 31 Practice Examination Handouts
John Serabian
Charlie Willis

1990 Certification Course						
NAME	COMPANY	ADDRESS				PHONE
Arneudo	Joseph	FDA	1390 Piccard Dr.	Rockville	MD 20850	427-1050
Burchanowski	John	Army	STRBE-VR	Ft. Belvoir	VA 22060	664-5437
Camper	Larry	NRC		Washington	DC 20555	492-0573
Clark	James	NIST	Bldg Z35, Rm A132	Rockville	MD 20899	975-8516
Dolce	Kathleen	NIH	9000 Rockville Pk	Bethesda	MD 20892	496-574
Doranus	Steven	Naval Med. C.		Bethesda	MD 20814	295-5422
Faraz	Yawar	MUS	910 Clopper Rd	Gaithersburg	MD 20877	258-8750
Fenton	Nora	HPSI	4 Research Pl #140	Rockville	MD 20850	670-1818
Haapala	Marvin		1307 Lake Elm Dr.	Billings	MT 59105	(406)259-4443
Hill	Dan	HPSI	4 Research Pl #140	Rockville	MD 20850	(800)969-4774
Kerns	Kenneth	DNA/AFRR1		Bethesda	MD 20814-5145	295-2299
Krueger	Suzanne	K-G HP	8114 Sandpiper Cr	Baltimore	MD 21236	529-4440
LaVake	Thomas	NIH	9000 Rockville Pk.	Bethesda	MD 20892	496-5774
Liotta	Philip	Naval Med C	Code 047	Bethesda	MD 20814	295-5426
Melanson	Mark	Army	107 Chell Rd.	Joppe	MD 21085	679-8528
Mengers	Timothy	NIST	Bldg Z35 Rm A106	Gaithersburg	MD 20899	975-5810
Myers	Pete	Army	Walter Reed	Washington	DC 20307	427-5104
Nicholson	Nora	VEPCO	PO Box 402	Mineral	VA 23117	894-2419
Nunark	Neil	ERC Env.	321 Germantown Rd.	Fairfax	VA 22030	246-0421
Orlando	Nick	HPSI	4 Research Pl #140	Rockville	MD 20852	670-1818
Pierpont	Sujita	U. MD	Bldg 018 Rm 1102	College Park	MD 20742	454-5294
Rao	Nimi	NSWC	New Hampshire Ave	Silver Spring	MD 20908-5000	394-4292
Schlueter	Janet	NRC	Mail Stop 6-H-3	Washington	DC 20555	492-0633
Shandruk	Petro	FDA	5600 Fishers Ln	Rockville	MD 20857	443-2850
Vassar	John	Edison	6026 Tree Swallow	Columbia	MD 21044	992-4217
Watson	Bruce	BGE	Calvert Cliffs	Lusby	MD 20657	260-4740
Webb	Arthur	AFRR1	Nat. Naval Med. Ct.	Bethesda	MD 20814-5145	295-0472
Williams	Betty Ann	AFRR1	Nat. Naval Med. Ct.	Bethesda	MD 20814-5145	295-2299
Zaramba	Loren	CDRH	1390 Piccard Dr.	Rockville	MD 20850	427-1050