

DOCKET NO. (s) 030-01317  
030-06895

PAGE 1 OF \_\_\_\_\_

ATTACHED

- Appendix A
- Appendix B
- Appendix C
- Memo

INSPECTION REPORT NO. 88-01  
Walter Reed Army Medical Center  
Department of the Army  
Washington, D.C. 20012

LICENSEE CONTACT: \_\_\_\_\_ Telephone No: \_\_\_\_\_

LICENSE NO: 08-01738-02 *Leadiator* CATEGORY \_\_\_\_\_ PRIORITY: \_\_\_\_\_  
08-01738-03 *Medical* CATEGORY \_\_\_\_\_ PRIORITY: \_\_\_\_\_  
 \_\_\_\_\_ CATEGORY \_\_\_\_\_ PRIORITY: \_\_\_\_\_

INSPECTION DATE (s): \_\_\_\_\_ TYPE OF INSPECTION:  SPECIAL  ANNOUNCED  
 ROUTINE  UNANNOUNCED  
 DAYSHIFT  
 OTHER

SUMMARY OF FINDINGS AND ACTION

- NO NONCOMPLIANCE, CLEAR 591 ISSUED
- NO NONCOMPLIANCE, LETTER
- NONCOMPLIANCE, APPENDIX A
- ACTION ON PREVIOUS NONCOMPLIANCE, APPENDIX B
- NONCOMPLIANCE, 591 ISSUED
- SUPPLEMENTAL INFO, APPENDIX C

RECOMMENDATIONS  
SEE BASIS IN APPENDIX C

CHANGE CATEGORY TO: \_\_\_\_\_  CHANGE PRIORITY TO: \_\_\_\_\_  
 NEXT INSPECTION DATE: \_\_\_\_\_

PERSONS CONTACTED

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

*Information in this record was deleted  
in accordance with the Freedom of Information  
Act, exemptions 2 & 6  
FOIA-2006-0238*

INSPECTOR: John Pelchat

APPROVED: John S. Glue

*Portions Ex. 2 & 6* *MM/16*



AREAS INSPECTED AND FINDINGS

Licensee: \_\_\_\_\_ License No: \_\_\_\_\_ Amendment No: \_\_\_\_\_

INSPECTION ITEMS	CRITERIA	FINDING
1. <u>Organization</u>	Lic Cond _____	_____
Structure of organization as described in requirements?	<i>Major Gerald Connock RSO</i>	
Scope of Program? Patient load?	<i>Major Terry Minton Nuclear Pharmacist</i>	
NOTES & REMARKS:	<i>Blag 2</i>	
<i>2-3 brachytherapy proc / month</i>	<i>35-40 patients / day Tc (85%) 13 wk Th Ga 67</i>	
<i>2 Tc 99 7.45 Ci gen</i>	<i>2-131 diag uptake 2-3 wk oral soln 2-3 therapy 1n 111 WBC</i>	
	<i>I-125 Cr 51</i>	
	<i>RIA Laboratory 2 T-32 therapy 130nd 730 1/month</i>	
2. <u>Licensee Internal Audits</u>	Lic Cond _____	_____
Scope and frequency of audits as required?	<i>Weekly surveys by RSO staff. Reviewed by</i>	
Conducted by appropriate persons?	<i>NBOIC (Non comm. officer in charge) Audited RSO</i>	
Records maintained?		
Reviewed by management?	<i>Problem findings result in contact by RSO</i>	
Deficiencies identified and corrected?	<i>Yes</i>	
NOTES & REMARKS:		
3. <u>Training and Qualification of Personnel</u>	Lic Cond _____	_____
Training & retraining conducted as required?		
Written & oral exams conducted?		
Examination results reviewed by management?		
Instructions to workers per 19.12?	19.12	
Authorized users? On license? Available in emergency?	Lic Cond _____	
NOTES & REMARKS:		
4. <u>Radiation Protection Procedures</u>	Lic Cond _____	_____
Procedures available and implemented?		
Identify radiopharmaceutical and dose(s)? <i>Rad. Pharm labeled as req. Patient pos. 1 Det. by spelling last name</i>		
Cover handling of patients receiving therapeutic doses? Cover handling of cadavers?		
Close out Surveys on Patients receiving temporary implants?	35.14 (b)(5)(v)	
Emergency procedures for spills, etc?		
Personnel understand procedures?		
NOTES & REMARKS:		

AREAS INSPECTED AND FINDINGS

Licensee: \_\_\_\_\_ License No: \_\_\_\_\_ Amendment No: \_\_\_\_\_

INSPECTION ITEM	CRITERIA	FINDING
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5. Use of Materials

Procurement and use as required? Authorized form & route of administration?	35.14(b)	<i>Yes only authorized uses of RAM</i>
Special tests (moly breakthrough, leak tests, etc) required?	35.14(b)(4)	<i>No records incomplete but backup records show testing performed as required</i>
Inventory of brachytherapy sources? Combined w/ leak test records performed @ reg frequency	35.14(b)(5)	<i>Linearity tests performed as required. All results within ± 5%.</i>
Dose calibration checks performed? Accuracy tests performed w/ NBS sources every 6 months. Security to results available	20.203	<i>Security to results available</i>
Posting & labeling as required?		<i>All syringes &amp; vials labeled as required</i>

NOTES & REMARKS:

6. Storage of Materials

Material secured in both restricted and unrestricted areas? Adequately?	20.207	<i>Research areas <del>are</del> have access control ID badges required. Staff challenges non-routine personnel</i>
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NOTES & REMARKS:

7. Facilities

Lic Cond \_\_\_\_\_

As described in lic cond or application?  
Any changes made? Adequacy?

NOTES & REMARKS:

8. Instruments

Lic Cond \_\_\_\_\_

Survey meters & instruments adequate for program? *Appropriate instrumentation available*  
Instruments & meters operable? *Yes* Calibrated? *Yes*  
Calibration adequate? *Yes*

NOTES & REMARKS:

## AREAS INSPECTED AND FINDINGS

Licensee: \_\_\_\_\_ License No: \_\_\_\_\_ Amendment No: \_\_\_\_\_

INSPECTION ITEMS	CRITERIA	FINDING
<b>9. Receipt and Transfer of Material</b>		
Written procedures for pickup, receiving, opening packages? <i>Yes</i>	20.205	<i>Complete tracking system on PC</i>
Survey of packages when received? <i>Yes</i>	20.205(c)(1)	<i>for tracking receipt of RAM</i>
Records of survey of packages? <i>Yes</i>	20.401(b)	<i>compare receipt vs auth limits</i>
Transfer of materials proper? Transfer records maintained? <i>Only return to vendors</i>	30.41, 30.51	<i>Licenses of RAM receivers maintained</i>
Authorized containers used? Shipping papers & package labels proper for packages on hand? <i>Yes</i>	71.5	<i>Note - under timely renewal Quadret in FL expired 6/30/85</i>
NOTES & REMARKS:		
<b>10. Personnel Protection - External</b>		
Personnel monitoring controls adequate? <i>Yes</i> Exposures minimized? - <i>Yes for RAM Users</i>	20.101, 20.202	
Exposure records (NRC-4 or 5) maintained? Available for employee review?	20.102(b), 20.401(a)	<i>One reported overexposure 1.8 RWB &amp; 1.7 ext for 3/1-4/4/87. Was investigated by RPO staff. User suspended pending result. Determined to be result of storage of dosimetry in vicinity of P-32 for 2 wks, not a real expo</i>
Surveys conducted? Adequate? <i>Yes</i>	20.201	
Records of monitoring, surveys? <i>Yes</i>	20.401	<i>Complete documentation</i>
Levels in unrestricted areas within limits? (Particularly around nuclear med. hot lab rooms of brachytherapy patients)	20.1, 20.105	
NOTES & REMARKS:		
<b>11. Personnel Protection - Internal</b>		
Airborne concentrations in restricted areas? (Xe-133, patients treated with I-131)	20.103	<i>No assay for C14 or H3</i>
Exposures to minors? <i>No minors</i>	20.104	<i>Reg. min sen I125 0.4 mCi I131 0.8 mCi</i>
Posting of airborne radioactivity areas?	20.203(d)	<i>Investigational 12 mCi 6 mCi</i>
Survey, monitoring bioassay adequate for airborne radioactivity, surface contamination? Records maintained?	20.201 20.401	
Procedures for use of Xe-133 followed? - <i>Closed Xe handling system checked weekly</i>		
NOTES & REMARKS: <i>Room under - pressure evaluated 6 m</i>		

## AREAS INSPECTED AND FINDINGS

Licensee: \_\_\_\_\_ License No: \_\_\_\_\_ Amendment No: \_\_\_\_\_

INSPECTION ITEM	CRITERIA	FINDING
<u>12. Effluent Controls, Waste Disposal</u>		
Release of effluents controlled? (particularly Xe-133, radioiodine where used)	20.106, 20.33	
Waste disposals controlled?	20.301, 20.303, 20.304, 20.305	
Procedures, records maintained?	20.401, Lic Cond _____	
Surveys made? Adequate?	20.401	
NOTES & REMARKS:		
<hr/>		
<u>13. Notifications and Reports</u>		
To individuals? <i>None other than routine</i>	19.13	<i>System for notifying under when ALARA or investigational limits exceeded. Several interviewed individuals aware of prev investigations</i>
Overexposures, excessive levels & concentrations, incidents? <i>No</i>	20.403, 20.405	
Personnel exposures and monitoring, termination reports? <i>None required</i>	20.407, 20.408	
Theft or loss of licensed material? <i>No</i>	20.402	
Misadministrations? <i>yes as required see notes</i>	35.41-35.45	
NOTES & REMARKS:		
<hr/>		
<u>14. Posting of Notices</u>		
Part 20, license & documents, procedures, notice of violations posted?	19.11(a)	<i>Very numerous postings</i>
NRC-3 posted?	19.11(c)	
NOTES & REMARKS:		
<hr/>		
<u>15. Other License Conditions</u>		

AREAS INSPECTED AND FINDINGS

Licensee: \_\_\_\_\_ License No: \_\_\_\_\_ Amendment No: \_\_\_\_\_

INSPECTION ITEMS	CRITERIA	FINDING
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16. Confirmatory Measurements

NRC Instrument: <sup>L-16</sup> L-142 Calibration Due Date: \_\_\_\_\_  
 L-16 28000 cpm w/ Std

17. Independent Inspection Effort

18. Incidents and Events

Any incidents of misadministrations, contamination, etc., not otherwise covered by reports?

35.41 -35.45  
20.402, 20.403, 20.405

(July 82)

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APPENDIX A - DOCUMENTATION OF NONCOMPLIANCE

Licensee: \_\_\_\_\_

License No: \_\_\_\_\_

Reference	Basis for noncompliance
Report item _____ 10 CFR <u>20.205(b)(c) &amp; 20.401(a)</u> Lic Cond _____ Type n/c _____	
Report item _____ 10 CFR _____ Lic Cond <u>20</u> Type n/c _____	
Report item _____ 10 CFR _____ Lic Cond _____ Type n/c _____	
Report item _____ 10 CFR _____ Lic Cond _____ Type n/c _____	
Report item _____ 10 CFR _____ Lic Cond _____ Type n/c _____	
Report item _____ 10 CFR _____ Lic Cond _____ Type n/c _____	

(July 82)

INSPECTION REPORT NUMBER \_\_\_\_\_

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APPENDIX B - LICENSEE ACTION ON PREVIOUS INSPECTION FINDINGS

Licensee: \_\_\_\_\_

License No: \_\_\_\_\_

Identification and summary of action taken	Status
<p>Report No: <u>86-01</u> Type n/c: <u>10 CFR 20.201</u> Describe: <u>Failure to perform Adequate survey RAM in trash</u>            Action taken:</p>	<p>OPEN  <input checked="" type="radio"/> CLOSED</p>
<p>Report No: <u>86-01</u> Type n/c: <u>10 CFR 20.201</u> Describe: <u>Failure to perform adequate survey for No F.B. for run</u>            Action taken:</p>	<p>OPEN  <input checked="" type="radio"/> CLOSED</p>
<p>Report No: <u>86-01</u> Type n/c: <u>10 CFR 20.201</u> Describe: <u>Failure to perform adequate survey No cut down for P-32 case</u>            Action taken:</p>	<p>OPEN  <input checked="" type="radio"/> CLOSED</p>
<p>Report No: <u>86-01</u> Type n/c: <u>Tedown cond.</u> Describe: <u>No lab coats in nuc med lab</u>            Action taken:  <u>Observed 3 different techs wearing lab coats</u></p>	<p>OPEN  <input checked="" type="radio"/> CLOSED</p>
<p>Report No: <u>86-01</u> Type n/c: <u>Tedown cond</u> Describe: <u>Failure to wear assigned dosm</u>            Action taken:</p>	<p>OPEN  <input checked="" type="radio"/> CLOSED</p>
<p>Report No: <u>86-01</u> Type n/c: <u>Tedown cond.</u> Describe: <u>Failure to use syringe shield</u>            Action taken:  <u>Observed</u></p>	<p>OPEN  <input checked="" type="radio"/> CLOSED</p>

(July 82)

INSPECTION REPORT NUMBER \_\_\_\_\_

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## APPENDIX C - SUPPLEMENTARY INFORMATION

Licensee: \_\_\_\_\_

License No: \_\_\_\_\_

- |   |  |
|---|--|
| <input type="checkbox"/> Uncorrected/repeated noncompliance       | <input type="checkbox"/> Unresolved items                |
| <input type="checkbox"/> Unusual occurrence, conditions, etc      | <input checked="" type="checkbox"/> Inspector's comments |
| <input type="checkbox"/> Basis for change of Category or Priority |  |

*Open item from prev. inspection (cont)**Report 86-01 Failure to conduct bioassay of individual using  $\geq 1$  mCi I-125**CLOSED*

*Open item (LER) Diagnostic Misadministration - misadmin of Tc 99m-O<sub>4</sub> instead of prescribed Tc 99m MD  
 Due to "lapse of SOP" Separate partition used to separate pharmaceuticals. Failed to return O<sub>4</sub> to partition.  
 Then drew dose. Briefed tech staff on procedures. Developed alternate procedures to identify Tc saline  
 using different size vials. Reviewed during inspection; preventative & corrective actions appear  
 complete Item closed for this inspection*

Major General Lewis A  
C.O. Mologne ~~MC~~

Radiation Control Committee - Deputy Commander Clinical Services, WRAMC

Walter Connock Health Physics Officer

RAMC  
5000 military emp  
5000 civilian emp

James E. Haslerga

Health Physics Officers

Operations  
day to day operations  
inspections lab  
reactive  
brachy support  
therapy support  
wipes collected

Tech Services  
ALARA  
dosimetry  
dosimetry eval  
Monitoring instr.  
wipes counted  
Training

Radiation Material Control  
Receipt & distribution of RAM  
Confirming authorization  
6 month audits of program

Initial Training 16 hours

Recurrent training Annual frequency

COL Jay Anderson Chief of Nuclear Medicine

COL Nasser Ghacol Chief of Dept of Radiology

On site police & fire services

Int Dietrich

Billy G Bass Director of Instrumentation (202) 576-

Cs 137

- small animal

350 used per year

Co 60

- small animal

FX2

List of authorized users Bass will operate system for ocean & new users

No transfer receipt or disposal of RAM

Watch McNeill

Minton

Glaser & Broe

Bill Beakwith RRO

Hazard Biologicals

H3 C14 S35 I125 In III

All animal no human use

30-40 auth users ~~100-150~~ 100-150 people work w/ RAM Lx-ray

5 authorizations including 1 for irradiator - 1 principle user

Institutional RSC for program → non-human use → RCO

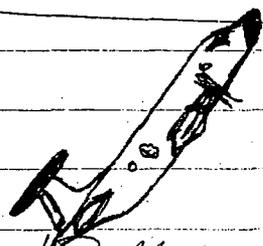
Order RAM receipt survey

116 labs

Lab surveys perf. monthly

Steve Tobery

Iod ↔ Broussey



I said it was good for me.

Bioassay Tolberg Procedure 3/4/86  
5/5/86

Bioassay 3/12/86  
5/6/86

Merrill  $\odot$

4/22/88

~~Bioassay 4/26/88~~

4/19/88

4/15/88

prob

4/12/88 after bioassay

4/12/88

3/14/88

3/8/88

2/19/88

2/9/88

1/13/88

1/26/88

Rommelburg No bioassay since 1/24/88

No records for receipt surveys

Peter Petrosia

Exp 6

2 NEN containers

5 iododeoxydridine 500  $\mu$ Ci I-125 <sup>cont # NEX 072 031698 Day 127</sup> assay date 8/4/78

Sodium iodide 2 mCi NEZ 0331 8/4/78 027256 day 123

Previous owner was chemist for local cancer treatment group

Current owner been in home for 4 years

Survey w/ L-14C & L-16 analyses all background readings

L-16 checked w/ mock iodine 125 source

Advised that disposal as normal trash would be appropriate

LICENSE NO: \_\_\_\_\_

DOCKET NO. (s) \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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ATTACHED

- Appendix A
- Appendix B
- Appendix C
- Memo

INSPECTION REPORT NO. \_\_\_\_\_

*Walter Reed Army Medical Center*  
*Department of The Army*  
*Washington, DC 20012*

LICENSEE CONTACT: \_\_\_\_\_ Telephone No: \_\_\_\_\_

LICENSE NO: \_\_\_\_\_ CATEGORY \_\_\_\_\_ PRIORITY: \_\_\_\_\_

\_\_\_\_\_ CATEGORY \_\_\_\_\_ PRIORITY: \_\_\_\_\_

\_\_\_\_\_ CATEGORY \_\_\_\_\_ PRIORITY: \_\_\_\_\_

INSPECTION DATE (s): \_\_\_\_\_ TYPE OF INSPECTION:  SPECIAL  ANNOUNCED  
 ROUTINE  UNANNOUNCED  
 DAYSHIFT  
 OTHER

SUMMARY OF FINDINGS AND ACTION

- NO NONCOMPLIANCE, CLEAR 591 ISSUED
- NO NONCOMPLIANCE, LETTER
- NONCOMPLIANCE, APPENDIX A

- ACTION ON PREVIOUS NONCOMPLIANCE, APPENDIX B
- NONCOMPLIANCE, 591 ISSUED
- SUPPLEMENTAL INFO, APPENDIX C

RECOMMENDATIONS  
SEE BASIS IN APPENDIX C

- CHANGE CATEGORY TO: \_\_\_\_\_
- NEXT INSPECTION DATE: \_\_\_\_\_

CHANGE PRIORITY TO: \_\_\_\_\_

PERSONS CONTACTED

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

INSPECTOR: *John Pelchit*

APPROVED: *John S. Glenn*

INSPECTION PLAN AND REPORT NUMBER \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_  
 Plan Approved: \_\_\_\_\_ Date: \_\_\_\_\_  
 Licensee: \_\_\_\_\_ License No. \_\_\_\_\_

Inspection Items	Scheduled for Inspection	Post Inspection Status	Module No.
Management Meeting - Entrance and Exit Interviews (Required)			30703B
Program Requirements, MC 2850 (Required)			77710B
Followup on Noncompliance and Deviations			92702B
Independent Inspection Effort (Required)			92706B
Transportation			86740B

AREAS INSPECTED AND FINDINGS

Licensee: \_\_\_\_\_ License No: \_\_\_\_\_ Amendment No: \_\_\_\_\_

INSPECTION ITEMS CRITERIA FINDING

1. Organization

Lic Cond \_\_\_\_\_

Management organization? *Radiation Control Committee WRAAMC*

Radiation Protection Organization? *Hospital, Nuc. Med. Therapy VS Army Institute of Research WRAIR Armed Forces Institute Pathology*

Scope of Operation? *5000 military employees ~ 500 people are badged 5000 civilian employees ~ 200 with RAM*

NOTES & REMARKS: *85-90 principal users have RAM authorization All procedures must have formal protocols. I<sup>st</sup> use of protocol is observed & then obs periodically - Protocols approved by RCC*

2. Licensee Internal Audits

Lic Cond \_\_\_\_\_

Scope and frequency? *RCC receives RSO reports 1/2 by & written annual report*

Management controls? *Labs are visited weekly or monthly dependent on scope Labs have survey. Should survey find problem lab notified*

NOTES & REMARKS: *Problems refer to materials control RSO has provisional approval for some non-human use*

*Human use committee reviews all in-vivo*

3. Training and Instructions to Employees

Lic Cond \_\_\_\_\_

Training program, scope and frequency, retraining?

Required tests administered; scores satisfactory? *Yes*

Instructions to workers? *19.12 Basic principles of Rad Protection course req. for all new personnel w/ specific recs being annually general every five years*

NOTES & REMARKS:

4. Radiation Protection Procedures

Operating & emergency procedures implemented? Lic Cond \_\_\_\_\_

Security? 20.207

NOTES & REMARKS:

5. Materials, Facilities and Instruments

Authorized uses and quantities? Lic Cond \_\_\_\_\_

Restricted areas, posting requirements? 20.203

Survey instruments & dosimeters; operable, properly calibrated?

NOTES & REMARKS:

RCC  
Memberships  
by Clinical  
dept using  
RAM  
Surgery  
Medicine  
Radiology  
AFIP  
WRAR  
Safety

## AREAS INSPECTED AND FINDINGS

Licensee: \_\_\_\_\_ License No: \_\_\_\_\_ Amendment No: \_\_\_\_\_

INSPECTION ITEM	CRITERIA	FINDING
<b>6. <u>Receipt and Transfer of Materials</u></b>		
Procedures implemented, adequate?	20.205, 71.51	
Transfer of byproduct material?	30.41	
Control of source material,	40.51, 40.64, 70.42, 70.51, 70.53, 70.54	
Labeling and packaging?	71.5, 49CFR 170-189	
Records of receipt, transfer, storage, survey, and monitoring?	30.51	
Procedures for pickup, receipt, monitoring of packages?	20.205(b)&(c)	
NOTES & REMARKS:		
<hr/>		
<b>7. <u>Personnel Protection - External</u></b>		
Personnel monitoring control; minimize exposures, control of accumulated dose?	20.101, 201.102, 20.202	
Surveys conducted, adequate?	20.201	
Records of monitoring, surveys, disposals?	20.401, Lic Cond _____	
Levels in unrestricted areas?	20.1, 20.105	
NOTES & REMARKS:		
<hr/>		
<b>8. <u>Personnel Protection - Internal</u></b>		
Airborne concentrations in restricted areas?	20.103	
Exposure of minors?	20.104	
Posting of airborne radioactivity areas?	20.203	
Survey, monitoring bioassay requirements; records?	20.201, 20.401	
Leak tests of sealed sources?	Lic Cond _____	
NOTES & REMARKS:		

## AREAS INSPECTED AND FINDINGS

Licensee: \_\_\_\_\_ License No: \_\_\_\_\_ Amendment No: \_\_\_\_\_

INSPECTION ITEM	CRITERIA	FINDING
<b>9. <u>Effluent Control; Waste Disposal</u></b>		
Release of effluents?	20.106	
Waste disposal, proper packaging for shipment?	20.301, 20.303, 20.304, 20.305	
Procedures, records?	20.401, Lic Cond _____	
NOTES & REMARKS:		
<b>10. <u>Transportation</u></b>		
Management controls, audits?		
Selection of packaging?	49 CFR 173.393-5; 10 CFR 71	
Preparation of packages for shipment? Filling and loading, closing, liquids?	49 CFR 172.173	
Markings & labelling?	49 CFR 172.300	
Monitoring?	49 CFR 172.402, 403	
	49 CFR 173.393	
Shipping papers, loading and placarding of vehicles?	49 CFR 172.200	
Reports of incidents?	49 CFR 171.15, 171.16	
Training program?		
Examination of packages?		
NOTES & REMARKS:		
<b>11. <u>Notifications and Reports</u></b>		
To individuals?	19.13	
Overexposures, excessive levels and concentrations, incidents?	20.403, 20.405	
Personnel exposures and monitoring, termination reports?	20.407, 20.408	
Theft or loss of licensed materials?	20.402	
NOTES & REMARKS:		

## AREAS INSPECTED AND FINDINGS

Licensee: \_\_\_\_\_ License No: \_\_\_\_\_ Amendment No: \_\_\_\_\_

INSPECTION ITEM	CRITERIA	FINDING
12. <u>Posting of Notices</u>		
Part 20, license & documents, procedures, notice of violations?	19.11(a)	
NRC-3?	19.11(c)	
NOTES & REMARKS:		
13. <u>Environmental Monitoring Program</u>	Lic Cond _____	
Implementation of program, scope and frequency as required?	<i>Sewer sampled once per year</i>	
Records maintained, reviewed by management?		
NOTES & REMARKS:		
14. <u>Emergency Preparedness</u>	Lic Cond _____	
Procedures available for incidents and accidents?		
Training for personnel; coordination with supporting groups and agencies?		
NOTES & REMARKS:		
15. <u>Other License Conditions</u>		
NOTES & REMARKS:		

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777108 - Industrial - Academic

AREAS INSPECTED AND FINDINGS

Licensee: \_\_\_\_\_ License No: \_\_\_\_\_ Amendment No: \_\_\_\_\_

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INSPECTION ITEM	CRITERIA	FINDING
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16. Confirmatory Measurements \_\_\_\_\_

Licensee's surveys verified on sampling basis? 201.105, 20.201

NOTES & REMARKS:

NRC Instrument: \_\_\_\_\_ Calibration due date: \_\_\_\_\_

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17. Independent Inspection Effort \_\_\_\_\_

NOTES & REMARKS:

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APPENDIX A - DOCUMENTATION OF NONCOMPLIANCE

Licensee: \_\_\_\_\_

License No: \_\_\_\_\_

Reference	Basis for noncompliance
Report item _____ 10 CFR _____ Lic Cond _____ Type n/c _____	
Report item _____ 10 CFR _____ Lic Cond _____ Type n/c _____	
Report item _____ 10 CFR _____ Lic Cond _____ Type n/c _____	
Report item _____ 10 CFR _____ Lic Cond _____ Type n/c _____	
Report item _____ 10 CFR _____ Lic Cond _____ Type n/c _____	
Report item _____ 10 CFR _____ Lic Cond _____ Type n/c _____	

APPENDIX B - LICENSEE ACTION ON PREVIOUS INSPECTION FINDINGS

Licensee: \_\_\_\_\_

License No: \_\_\_\_\_

Identification and summary of action taken	Status
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Report No: \_\_\_\_\_ Type n/c: \_\_\_\_\_ Describe: \_\_\_\_\_

Action taken: \_\_\_\_\_  
OPEN  
CLOSED

Report No: \_\_\_\_\_ Type n/c: \_\_\_\_\_ Describe: \_\_\_\_\_

Action taken: \_\_\_\_\_  
OPEN  
CLOSED

Report No: \_\_\_\_\_ Type n/c: \_\_\_\_\_ Describe: \_\_\_\_\_

Action taken: \_\_\_\_\_  
OPEN  
CLOSED

Report No: \_\_\_\_\_ Type n/c: \_\_\_\_\_ Describe: \_\_\_\_\_

Action taken: \_\_\_\_\_  
OPEN  
CLOSED

Report No: \_\_\_\_\_ Type n/c: \_\_\_\_\_ Describe: \_\_\_\_\_

Action taken: \_\_\_\_\_  
OPEN  
CLOSED

Report No: \_\_\_\_\_ Type n/c: \_\_\_\_\_ Describe: \_\_\_\_\_

Action taken: \_\_\_\_\_  
OPEN  
CLOSED

INSPECTION REPORT NUMBER \_\_\_\_\_

Page \_\_\_\_\_ of \_\_\_\_\_

APPENDIX C - SUPPLEMENTARY INFORMATION

Licensee: \_\_\_\_\_ License No: \_\_\_\_\_

- 
- |   |   |
|---|---|
| <input type="checkbox"/> Uncorrected/repeated noncompliance       | <input type="checkbox"/> Unresolved items     |
| <input type="checkbox"/> Unusual occurrence, conditions, etc      | <input type="checkbox"/> Inspector's comments |
| <input type="checkbox"/> Basis for change of Category or Priority |   |
-

Adminstrations - 2 mCi/vial  
1 mCi/use

I 125 Procedure performed 4/26/88 1 mCi  
Breastay not performed til 5/3

200,000 cpm @ hand face

SP Olson - collect & segregate waste org & trig secy liq  
long & short  $t_{1/2}$  solids

~~Audits~~  
~~Survey Records~~

Daily Nuc Med Surveys

---

Quarterly Radiation Control Committee

Adequate representation of depts on committee

Docket Nos. 30-1317  
30-6895  
30-0125  
30-6896

JAN 19 1979

Department of the Army  
ATTN: General George J. Baker  
Commanding Officer  
Walter Reed Army Medical Center  
Washington, D. C. 20012

Gentlemen:

Subject: Inspection 79-01

This refers to the inspection conducted by Mr. M. Slobodien of this office on January 10-11, 1979, of activities authorized by NRC License Nos. 08-1738-02, 03, 04, and 05 and to the discussions of our findings held by Mr. Slobodien with Colonel R. Quillen of your staff at the conclusion of the inspection.

The inspection was an examination of activities conducted under your licenses as they relate to radiation safety and to compliance with the Commission's rules and regulations and the conditions of your licenses. The inspection consisted of selective examinations of procedures and representative records, interviews with personnel, measurements made by the inspector, and observations by the inspector.

Within the scope of this inspection, no items of noncompliance were observed.

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter will be placed in the Public Document Room.

*W/J*

OFFICE ▶	FFMS	FFMS				
SURNAME ▶	<i>MS</i> Slobodien/jl	<i>MS</i> McClendock				
DATE ▶	1/18/79	1/18/79				

JAN 19 1979

No reply to this letter is required; however, should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,

Robert O. McClintock, Chief  
Materials Radiological Protection  
Section

cc:  
Colonel R. Quillen

bcc:  
IE Mail & Files (For Appropriate Distribution)  
Central Files  
Public Document Room (PDR)  
Nuclear Safety Information Center (NSIC)  
REG:I Reading Room  
District of Columbia

OFFICE ▶						
SURNAME ▶						
DATE ▶						

**U. S. ATOMIC ENERGY COMMISSION  
BYPRODUCT MATERIAL LICENSE**

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 30, Licensing of Byproduct Material, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, own, possess, transfer and import byproduct material listed below; and to use such byproduct material for the purpose(s) and at the place(s) designated below. This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, and is subject to all applicable rules, regulations, and orders of the Atomic Energy Commission now or hereafter in effect and to any conditions specified below.

<b>Licensee</b>		3. License number <b>8-1738-3 (H65)</b>
1. Name <b>Department of the Army Walter Reed Army Medical Center</b>	2. Address <b>Division of Nuclear Medicine and Chemistry Department of Radiobiology Washington, D.C.</b>	4. Expiration date <b>August 31, 1965</b>
5. Reference No.		
6. Byproduct material (element and mass number)  <b>A. Cobalt 60</b>	7. Chemical and/or physical form  <b>A. Atomic Energy of Canada Limited Sealed Sources.</b>	8. Maximum amount of radioactivity which licensee may possess at any one time  <b>A. 1500 curies</b>

9. Authorized use  
**A. For use in Atomic Energy of Canada Limited Gammacell 220 Irradiator.**

**CONDITIONS**

- 10. Unless otherwise specified, the authorized place of use is the licensee's address stated in Item 2 above.
- 11. The licensee shall comply with the provisions of Title 10, Part 20, Code of Federal Regulations, Chapter 1, "Standards for Protection Against Radiation".
- 12. Byproduct material shall be used by, or under the <sup>direct</sup> supervision of, persons designated by the ~~Walter Reed Army Medical Center~~, Colonel Richard P. Mason, Chairman.
- 13. Byproduct material as sealed sources shall not be opened.
- 14. Sealed sources shall be tested for leakage and/or contamination in accordance with the following:
  - A. Leak test shall be performed in accordance with procedures in document entitled, "Operation and Leak Testing Procedures Followed for Gammacell 220", submitted with letter dated July 27, 1960 signed by Colonel Arthur P. Long.

(See page 2)

XII

Supplementary Sheet

License Number 8-1738-3  
(H65)

CONTINUED:

## CONDITIONS

- B. Each sealed source containing byproduct material with a half-life greater than thirty (30) days and in any form other than gas, shall be tested for leakage and/or contamination as follows:
- (1) An appropriate test for leakage and/or contamination shall be performed on the sealed source surface, or on the accessible surfaces of the device in which such a sealed source is permanently or semipermanently mounted. The test shall be performed upon receipt of a source from another person, unless the licensee receives certification from the person making the transfer that the sealed source had been tested within thirty (30) days prior to transfer and found free of any removable radioactive material.
  - (2) Following completion of the test prescribed in B(1), each sealed source shall be tested for leakage and/or contamination at intervals not to exceed six (6) months.
- C. The test performed pursuant to B shall be sufficiently sensitive to detect 0.05 microcurie of removable beta and/or gamma emitting radioactive material. Records of leak test results shall be maintained by the licensee.
- D. If the test performed pursuant to B(1) or B(2) reveals removable radioactive material, the licensee shall take immediate action to prevent spread of contamination and, within thirty (30) days after completion of the test, shall notify the Isotopes Branch, Division of Licensing and Regulation, U.S. Atomic Energy Commission, Washington 25, D.C.
- E. Repair of sources shall be performed by the manufacturers of the sources or by persons specifically licensed by the Commission to perform such repairs.
15. Except as otherwise specifically provided for in the license, the licensee shall possess and use byproduct material described in Items 6, 7 and 8 of this license in accordance with statements, representations, and procedures contained in his application dated June 22, 1960, and in related documents and amendments as follows:
- A. "Atomic Energy of Canada Limited Operation and Maintenance Manual Gammacell 220", dated June 15, 1960.
  - B. "Safety Instruction for Gammacell 220", submitted with application dated June 22, 1960.
  - C. "Operation and Leak Testing Procedures Followed for Gammacell 220", submitted with letter dated July 27, 1960 signed by Colonel Arthur P. Long.

(See page 3)

U. S. ATOMIC ENERGY COMMISSION  
PRODUCT MATERIAL LICENS

Supplementary Sheet

License Number 8-1738-3  
(H65)

CONTINUED:

CONDITIONS

16. Written administrative instructions referenced in Condition 15A, 15B, and 15C covering radiological protection, control, and security of byproduct material shall be followed and a copy of instructions shall be supplied to each individual using or having responsibility for use of such material. Any changes in the administrative instructions shall have the prior approval of the Isotopes Branch, Division of Licensing and Regulation.

DUPLICATED  
FOR DIV. OF INSP.

Date August 4, 1960

For the U. S. Atomic Energy Commission

by [Signature] Chief, Isotopes Branch

Division of Licensing and Regulation  
Washington 25, D. C.

[Signature]

8-460

**S. ATOMIC ENERGY COMMISSION**  
**BYPRODUCT MATERIAL LICEN. NO. 8-1738-3, AMENDMENT NO. 1**  
**(865)**

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 30 Licensing of Byproduct Material, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, own, possess, transfer and import byproduct material listed below; and to use such byproduct material for the purpose(s) and at the place(s) designated below. This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954 and is subject to all applicable rules, regulations, and orders of the Atomic Energy Commission now or hereafter in effect and to any conditions specified below.

Licensee		In accordance with application dated November 22, 1960, 8-1738-3 is amended in its entirety to read as follows:	
1. Name <b>Department of the Army Walter Reed Army Medical Center</b>	3. License number	August 31, 1965	
2. Address <b>Division of Nuclear Medicine Department of Radiobiology Washington, D. C.</b>	4. Expiration date		
		5. Reference No.	
6. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radioactivity which licensee may possess at any one time	
A. Cobalt 60 B. Cobalt 60	A. AECL Sealed Sources B. Sealed Sources (Encapsulated per Budd Co. Drawing D-50413)	A. 1500 curies B. 1000 curies	
9. Authorized use			
A. To be used in an AECL Gammacell 220 Irradiator for research and development in radiobiology and dosimetry.			
B. To be used in a small animal irradiator (as shown in Budd Co. Drawing T-70025) for radiobiological research.			

**CONDITIONS**

10. Unless otherwise specified, the authorized place of use is the licensee's address stated in Item 2 above.
11. The licensee shall comply with the provisions of Title 10, Part 20, Code of Federal Regulations, Chapter 1, "Standards for Protection Against Radiation".
12. Byproduct material shall be used by, or under the direct supervision of, persons designated by the Isotope Committee of Walter Reed Army Medical Center, Colonel Richard P. Mason, Chairman.
13. Byproduct material as sealed sources shall not be opened.
14. A. Sealed sources containing Cobalt 60 shall be tested for leakage and/or contamination at intervals not to exceed six (6) months. In the absence of a certificate from a transferor indicating that a test has been made within six (6) months prior to the transfer, the sealed source shall not be put into use until tested.

(See Page 2)

X/2

Supplementary Sheet

Continued from Page 1

License Number 8-1738-3  
(H65)

AMENDMENT NO. 1

CONDITIONS

14. (Continued)

- B. The test shall be capable of detecting the presence of 0.005 microcuries of contamination on the test sample. The test sample shall be taken from appropriate accessible surfaces of the device in which the sealed source is permanently mounted. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission.
- C. If the test reveals the presence of 0.005 microcuries or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Commission regulations. A report shall be filed within five (5) days of the test with the Director, Division of Licensing and Regulation, U. S. Atomic Energy Commission, Washington 25, D. C., describing the equipment involved, the test results and the corrective action taken. A copy of such report shall be sent to the manager of the nearest AEC operations office listed in Appendix D of Title 10, Code of Federal Regulations, Part 20.
- D. Tests for leakage and/or contamination shall be performed by, or under the direct supervision of, persons designated by the Isotope Committee of Walter Reed Army Medical Center, Colonel Richard P. Mason, Chairman.
15. Except as otherwise specifically provided for in the license, the licensee shall possess and use byproduct material described in Subitems 6A, 7A and 8A of this license in accordance with statements, representations, and procedures contained in his application dated June 22, 1960, and in related documents and amendments as follows:
- A. "Atomic Energy of Canada Limited Operation and Maintenance Manual Gammacell 220", dated June 15, 1960.
- B. "Safety Instruction for Gammacell 220", submitted with application dated June 22, 1960.
- C. "Operation and Leak Testing Procedures Followed for Gammacell 220", submitted with letter dated July 27, 1960, signed by Colonel Arthur P. Long.
16. Except as specifically otherwise provided for in the license, the licensee shall possess and use byproduct material described in Subitems 6B, 7B and 8B of this license in accordance with statements, representations, and procedures contained in his application dated November 22, 1960 and Section III entitled "Operation" of document entitled "Operating and Maintenance Manual, Cobalt 60 Irradiator for Walter Reed Army Medical Center, Washington, D. C."

Supplementary Sheet

Continued from Page 2

License Number 8-1738-3  
(H65)

AMENDMENT NO. 1

CONDITIONS

- 17. Written administrative instructions referenced in Condition 15A, 15B, and 15C covering radiological protection, control and security of byproduct material shall be followed and a copy of instructions shall be supplied to each individual using or having responsibility for use of the material described in Subitems 6A, 7A and 8A.

Written operating instructions as contained in Section III entitled "Operation" of document entitled "Operating and Maintenance Manual, Cobalt 60 Irradiator for Walter Reed Army Medical Center, Washington, D. C." shall be supplied to each person using or having responsibility for use of the material described in Subitems 6B, 7B and 8B.

For the U. S. Atomic Energy Commission

Original Signed By  
James R. Mason

by Chief, Isotopes Branch  
Division of Licensing and Regulation  
Washington 25, D. C.

Date March 13, 1961

**DUPLICATED**  
FOR DIV. OF COMPLIANCE

*1. Bar / result*

Supplementary Sheet

License Number 8-1738-3  
(H65)

AMENDMENT NO. 2

Department of the Army  
Walter Reed Army Medical Center  
Division of Nuclear Medicine  
Department of Radiobiology  
Washington, D. C.

Attention: Colonel Richard P. Mason, Chairman  
Isotope Committee

In accordance with application dated June 5, 1961, License No. 8-1738-3 is amended to revise the possession limit (Item 8B) for Cobalt 60 which is to be used in a small animal irradiator. Item 8B is changed from "1000 curies" to "1500 curies".

DUPLICATED  
FOR DIV. OF COMPLIANCE

For the U. S. Atomic Energy Commission

Original Signed By  
James R. Mason

by Chief, Isotopes Branch  
Division of Licensing and Regulation  
Washington 25, D. C.

Date June 12, 1961

1. Bar/overall

X/3

Supplementary Sheet

License Number 8-1738-3  
(H65)

Amendment No. 3

Department of the Army  
Walter Reed Army Medical Center  
Division of Nuclear Medicine  
Department of Radiobiology  
Washington, D.C.

In accordance with letter dated August 7, 1961, License No. 8-1738-3 is amended as follows:

Condition 12 is amended to read:

12. Byproduct material shall be used by, or under the supervision of, individuals designated by the Isotope Committee, Commanding General, Walter Reed Army Medical Center, Chairman.

Date August 18, 1961

**DUPLICATED**  
FOR DIV. OF COMPLIANCE

*719*  
*8-18-61*

For the U. S. Atomic Energy Commission  
Original signed By  
James R. Mason  
by Chief, Isotopes Branch

Division of Licensing and Regulation  
Washington 25, D. C.

*X14*

Supplementary Sheet

License Number 8-1738-3  
(H65)

AMENDMENT NO. 4

Department of the Army  
Walter Reed Army Medical Center  
Division of Nuclear Medicine  
Department of Radiobiology  
Washington, D. C.

In accordance with letter dated August 28, 1963, signed by W. V. Davis, Lt. Col., MSC, License No. 8-1738-3 is amended to add Condition No. 18 to read:

- 18. The licensee is authorized to remove two (2) sealed sources from the small animal irradiator to facilitate repair to the irradiator. This operation may be repeated when the two (2) preceding sources have been safely returned to the small animal irradiator. Source removal and replacement shall be in accordance with statements, representations, and procedures contained in the enclosures with the letter dated August 28, 1963, signed by W. V. Davis, letter dated November 22, 1963, signed by W. V. Davis, and the enclosures with the letter dated November 22, 1963, signed by W. V. Davis.

Date DEC 6 - 1963

*flu* *DMH* *CRB*

**DUPLICATED**  
FOR DIV. OF COMPLIANCE

For the U. S. Atomic Energy Commission

Original Signed by  
Cecil R. Buchanan

**Isotopes Branch**

Division of Licensing and Regulation  
Washington 25, D. C.

X/5

**S. ATOMIC ENERGY COMMISSION  
BYPRODUCT MATERIAL LICENSE**

1738-3  
B70

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 30, Licensing of Byproduct Material, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, own, possess, transfer and import byproduct material listed below, and to use such byproduct material for the purpose(s) and at the place(s) designated below. This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, and is subject to all applicable rules, regulations, and orders of the Atomic Energy Commission now or hereafter in effect and to any conditions specified below.

<b>Licensee</b>		<b>In accordance with application dated April 12, 1965,</b>	
1. Name <b>Department of the Army Walter Reed Army Medical Center</b>		3. License number <b>1738-3</b> is amended in its entirety to read as follows:	
2. Address <b>Division of Nuclear Medicine Department of Radiobiology Washington, D. C.</b>		4. Expiration date  <b>August 31, 1970</b>	
		5. Reference No.	
6. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radioactivity which licensee may possess at any one time	
A. Cobalt 60	A. AECL Sealed Sources	A. 1500 curies	
B. Cobalt 60	B. Sealed Sources (Encapsulated per Budd Co. Dwg. D-50413)	B. 1500 curies	
9. Authorized use			
A. To be used in AECL Gammacell 220 irradiator for research and development in radiation biology and radiation dosimetry.			
B. To be used in a small animal irradiator (per Budd Co. Dwg. T-70025) for research and development in radiation biology and radiation dosimetry.			

**CONDITIONS**

10. Unless otherwise specified, the authorized place of use is the licensee's address stated in Item 2 above:
11. The licensee shall comply with the provisions of Title 10, Part 20, Code of Federal Regulations, Chapter 1, "Standards for Protection Against Radiation."
12. Byproduct material shall be used by, or under the supervision of, individuals designated by the Isotope Committee, Commanding General, Walter Reed Army Medical Center, Chairman.
13. A. Each sealed source containing byproduct material shall be tested for leakage and/or contamination at intervals not to exceed 6 months. In the absence of a certificate from a transferor indicating that a test has been made within 6 months prior to the transfer, the sealed source shall not be used until tested.

(See Page 2)

X/6

## Supplementary Sheet

License Number 8-1738-3

(H70)

13. B. The tests shall be capable of detecting the presence of 0.05 microcurie of contamination on the test sample. The test sample shall be taken from appropriate accessible surfaces of the device in which the sealed source is permanently or semipermanently mounted or stored. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission.
- C. If the test reveals the presence of 0.05 microcurie or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Commission regulations. A report shall be filed within five days of the test with the Director, Division of Materials Licensing, U. S. Atomic Energy Commission, Washington, D. C., 20545, describing the equipment involved, the test results, and the corrective action taken. A copy of such report shall be sent to the Director, Region I, Division of Compliance, USAEC, 376 Hudson Street, New York, New York, 10014.
- D. Tests for leakage and/or contamination shall be performed by, or under the supervision of, individuals designated by the Isotope Committee, Commanding General, Walter Reed Army Medical Center, Chairman.
14. Written administrative instructions entitled, "Operation and Safety Procedures to be Followed for AECL Gammacell 220 Irradiator," and "Operation and Safety Procedures to be followed for Small Animal Irradiator," both dated March 25, 1965, shall be followed and a copy of these instructions shall be made available to each individual using or having responsibility for use of byproduct material. Any changes in these instructions shall have the prior approval of the Isotopes Branch, Division of Materials Licensing.
15. The licensee is authorized to remove two (2) sealed sources from the small animal irradiator to facilitate repair to the irradiator. This operation may be repeated with two (2) other sealed sources of the irradiator when the two (2) preceding sources have been safely returned to the small animal irradiator. Source removal and replacement shall be in accordance with statements, representations, and procedures contained in the enclosures with the letter dated August 28, 1963, signed by W. V. Davis, letter dated November 22, 1963, signed by W. V. Davis, and the enclosures with the letter dated November 22, 1963, signed by W. V. Davis.

For the U. S. Atomic Energy Commission

Original Signed by  
Dante B. Howell

by Isotopes Branch

Division of Materials Licensing  
Washington, D. C. 20545

Date JUN 15 1965

FCD  
DJA  
6-15-65

1/40/mb

Supplementary Sheet

License Number 8-1738-3  
(H70)

AMENDMENT NO. 6

Department of the Army  
Walter Reed Army Medical Center  
Washington, D. C.

Items 1 and 2, the name and address of the applicant, is revised to read:

Department of the Army  
Walter Reed Army Medical Center  
Washington, D. C.

Condition No. 14 is revised to read:

- 14. Written administrative instructions entitled, "Operation and Safety Procedures to be Followed for AECG Gammacell 220 Irradiator," and "Operation and Safety Procedures to be followed for Small Animal Irradiator," both dated March 25, 1965, as amended by letter dated June 22, 1965, from W. V. Davis, Lt. Col, MSG, shall be followed and a copy of these instructions shall be made available to each individual using or having responsibility for use of byproduct material. Any changes in these instructions shall have the prior approval of the Isotopes Branch, Division of Materials Licensing.

For the U. S. Atomic Energy Commission

Original Signed by  
Daniel B. Howell

by Isotopes Branch

Division of Materials Licensing  
Washington, D. C. 20545

Date JUL 22 1965

*Res H7-22-65*

*FCD*

*1 FCD/mlo*

*X/17*

MATERIAL LICENSE  
Supplementary Sheet

License Number 8-1738-3

(H70)

Amendment No. 7

Department of the Army  
Walter Reed Army Medical Center  
Washington, D. C.

In response to letter dated February 4, 1966, signed by W. V. Davis, License No. 8-1738-3 is amended as follows:

To add:

<p>6. Byproduct material (element and mass number)</p> <p>C. Cobalt 60</p>	<p>7. Chemical and/or physical form</p> <p>C. AECL Sealed Sources</p>	<p>8. Maximum amount of radioactivity which licensee may possess at any one time</p> <p>C. 1,500 curies</p>
--	---	---

9. Authorized use

C. To be used in an AECL Gammacell 220 irradiator in medical research and development.

Condition No. 14 is revised to read:

14. Written administrative instructions entitled, "Operation and Safety Procedures to be Followed for AECL Gammacell 220 Irradiator," and "Operation and Safety Procedures to be Followed for Small Animal Irradiator," both dated March 25, 1965, as amended by letter dated June 22, 1965, and "Operation and Safety Procedures to be Followed for AECL Gammacell 220 Irradiator," dated January 27, 1966, shall be followed and a copy of these instructions shall be made available to each individual using or having responsibility for use of byproduct material. Any changes in these instructions shall have the prior approval of the Isotopes Branch, Division of Materials Licensing, For the U. S. Atomic Energy Commission

Date FEB 18 1966

Original Signed by  
Daniel B. Howell  
by Isotopes Branch  
Division of Licensing and Regulation  
Washington 25, D. C.

*1 FCD/mb*  
*DH*  
*2-18-66* *FCD*

*X/8*

Supplementary Sheet

License Number **08-01738-03**

Amendment No. **08**

Department of the Army  
Walter Reed Army Medical Center  
Washington, D. C. 20012

In accordance with letter dated November 7, 1966, signed by R. Nystrom, Jr.,  
License Number 08-01738-03 is amended as follows:

Subitems 6.A., 7.A., and 8.A. are revised to read:

6. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radioactivity which licensee may possess at any one time
<b>A. Cobalt 60</b>	<b>A. AECL Sealed Source</b>	<b>A. 16,000 curies</b>
<b>To Add:</b>		
<b>D. Cesium 137</b>	<b>D. Sealed Source (U. S. Nuclear Type 371)</b>	<b>D. 120 curies</b>

9. Authorized use

**D. To be used in a U. S. Nuclear Corporation AN/UDM - 1A (C Cs E - 120m)  
"Radic" calibrator for instrument calibration.**

DEC 16 1966

Date \_\_\_\_\_

*Bed/ get*

*ped*

For the U. S. Atomic Energy Commission  
Original Signed by  
**Bruce W. Churchill**

by **Isotopes Branch**

Division of Materials Licensing  
Washington, D. C. 20545

*X/9*

Supplementary Sheet

License Number 08-01738-03  
Amendment No. 09

Department of the Army  
Walter Reed Army Medical Center  
Washington, D. C. 20012

In accordance with letter dated March 13, 1970, signed by LTC James A. Phillips, License Number 08-01738-03 is amended as follows:

Subitem 8.B. is amended to read:

8.B. 2,500 curies

For the U. S. Atomic Energy Commission

Original Signed by

Cecil R. Buchanan

**Isotopes Branch**

by \_\_\_\_\_

Division of Materials Licensing  
Washington, D. C. 20545

Date APR 10 1970

*erlb FCI  
4/19/70  
2 CD / gk*

*X/10*

U. S. ATOMIC ENERGY COMMISSION  
BYPRODUCT MATERIAL LICENSE

Amendment No. 10

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Parts 30, 32, 33, 34, and 35, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, own, possess, transfer and import byproduct material listed below; and to use such byproduct material for the purpose(s) and at the place(s) designated below. This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, and is subject to all applicable rules, regulations, and orders of the Atomic Energy Commission now or hereafter in effect and to any conditions specified below.

<p style="text-align: center;">Licensee</p> <p>1. Department of the Army Walter Reed Army Medical Center</p> <p>2. Washington, D. C. 20012</p>	<p>In accordance with application dated July 13, 1970,</p> <p>3. License number 08-01738-03 is amended in its entirety to read as follows:</p> <hr/> <p>4. Expiration date August 31, 1975</p> <hr/> <p>5. Reference No.</p>
--	--

6. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radioac- tivity which licensee may possess at any one time
A. Cobalt 60	A. AECL Sealed Source	A. 16,000 curies
B. Cobalt 60	B. Sealed Sources (Encapsulated per Budd Co. Dwg. D-50413)	B. 2,500 curies
C. Cobalt 60	C. AECL Sealed Sources	C. 1,500 curies

9. Authorized use

- A. To be used in AECL Gammacell 220 irradiator for research and development in radiation biology and radiation dosimetry.
- B. To be used in a small animal irradiator (per Budd Co. Dwg. T-70025) for research and development in radiation biology and radiation dosimetry.
- C. To be used in an AECL Gammacell 220 irradiator in medical research and development and radiation dosimetry.

CONDITIONS

- 10. Byproduct material listed under Subitems A. and B. may only be used at Walter Reed Army Institute of Research, Washington, D. C. Byproduct material listed under Subitem C. may only be used at Building 500, Forest Glen Section, Walter Reed Army Medical Center, Montgomery County, Maryland.

X/11

Supplementary Sheet

License Number 08-01738-03

**CONDITIONS**

**Amendment No. 10**

(Continued)

11. The licensee shall comply with the provisions of Title 10, Chapter 1, Code of Federal Regulations, Part 20, "Standards for Protection Against Radiation."
12. Byproduct material shall be used by, or under the supervision of, individuals designated by the Isotope Committee, Commanding General, Walter Reed Army Medical Center, Chairman.
13. A. Each sealed source containing byproduct material shall be tested for leakage and/or contamination at intervals not to exceed six months. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, the sealed source shall not be used until tested.  
  
B. The tests shall be capable of detecting the presence of 0.05 microcurie of contamination on the test sample. The test sample shall be taken from appropriate accessible surfaces of the device in which the sealed source is permanently or semipermanently mounted or stored. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission.  
  
C. If the test reveals the presence of 0.05 microcurie or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Commission regulations. A report shall be filed within five days of the test with the Director, Division of Materials Licensing, U. S. Atomic Energy Commission, Washington, D. C., 20545, describing the equipment involved, the test results, and the corrective action taken. A copy of such report shall also be sent to the Director, Region I, Division of Compliance, USAEC, 970 Broad Street, Newark, New Jersey, 07102.  
  
D. Tests for leakage and/or contamination shall be performed by, or under the supervision of, individuals designated by the Isotope Committee, Commanding General, Walter Reed Army Medical Center, Chairman.

Supplementary Sheet

License Number 08-01738-03

Amendment No. 10

CONDITIONS

(Continued)

14. Written administrative instructions entitled, "Operation and Safety Procedures to be Followed for AECL Gammacell 220 Irradiator", and "Operation and Safety Procedures to be Followed for Small Animal Irradiator", both dated March 25, 1965, as amended by letter dated June 22, 1965, and "Operation and Safety Procedures to be Followed for AECL Gammacell 220 Irradiator", dated January 27, 1966, shall be followed and a copy of these instructions shall be made available to each individual using or having responsibility for use of byproduct material. Any changes in these instructions shall have the prior approval of the Materials Branch, Division of Materials Licensing.
  
15. The licensee is authorized to remove two (2) sealed sources from the small animal irradiator to facilitate repair to the irradiator. This operation may be repeated with two (2) other sealed sources of the irradiator when the two (2) preceding sources have been safely returned to the small animal irradiator. Source removal and replacement shall be in accordance with statements, representations, and procedures contained in the enclosures with the letter dated August 28, 1963, signed by W. V. Davis, letter dated November 22, 1963, signed by W. V. Davis, and the enclosures with the letter dated November 22, 1963, signed by W. V. Davis.

For the U. S. Atomic Energy Commission

Original Signed by  
Jack M. Bell

by Materials Branch

Division of Materials Licensing  
Washington, D. C. 20545

Date AUG 12 1970

*DJB*  
*8-11-70*  
*[Signature]*  
*1 GWN/gc*

U. S. ATOMIC ENERGY COMMISSION  
BYPRODUCT MATERIAL LICENSE

Supplementary Sheet

License Number 08-01738-03

Amendment No. 11

Department of the Army  
Walter Reed Army Medical Center  
Washington, D. C. 20012

In accordance with letter dated July 18, 1972, signed by LTC James A. Phillips, License Number 08-01738-03 is amended as follows:

To add:

- |   |   |  |
|---|---|--|
| 6. Byproduct material<br>(element and mass number)<br>D. Cesium 137 | 7. Chemical and/or physical form<br>D. Sealed sources<br>(AECL Model<br>C-161-type 8) | 8. Maximum amount of radioactivity which<br>licensee may possess at any one time<br>D. 4200 curies total.<br>2 sources not to<br>exceed 2100 curies<br>each. |
|---|---|--|

9. Authorized use

- D. To be used in an AECL Gammacell 40 irradiator for small animal irradiation. This unit shall replace that described in Subitem B and shall be used in accordance with letter dated July 18, 1972, signed by LTC James A. Phillips.

Date     AUG 2    1972    

*FCD*  
*8/11/72*  
*FCD/3*

For the U. S. Atomic Energy Commission

Original signed by

FRANK C. DAVIS  
Materials Branch

by \_\_\_\_\_

Division of Materials Licensing  
Washington, D. C. 20545

*X/12*

Supplementary Sheet

License Number **08-01738-03**

**Amendment No. 12**

Department of the Army  
Walter Reed Army Medical Center  
Washington, D. C. 20012

In accordance with letter dated December 29, 1972, signed by Major Fred C. Brand,  
License Number 08-01738-03 is amended as follows:

Subitem 9.D. is amended to read:

9.D. To be used in an AECL Gammacell 40 irradiator for small animal irradiation.  
This unit shall replace that described in Subitem B and shall be used in  
accordance with letter dated July 18, 1972, signed by LTC James A. Phillips  
and operating procedures dated November 1, 1972, as submitted with letter  
dated December 29, 1972.

For the U. S. Atomic Energy Commission  
Original signature

**FRANK G. DAVIS**  
**Materials Branch**

Date FEB 23 1973

by \_\_\_\_\_  
Directorate of Licensing  
Washington, D. C. 20545

*FLC*  
*2/22/73*  
*F. G. Davis*

*X/13*

**U. S. NUCLEAR REGULATORY COMMISSION  
MATERIALS LICENSE**

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 1, Parts 30, 31, 32, 33, 34, 35, 36, 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); and to import such byproduct and source material. 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		<b>In accordance with application dated May 31, 1975,</b>	
1. Department of the Army Walter Reed Army Medical Center		3. License number <del>08-01738-03</del> is amended in its entirety to read as follows:	
2. Washington, D. C. 20012		4. Expiration date <b>August 31, 1980</b>	
		5. Docket or Reference No. _____	
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. Cobalt 60	A. Sealed Sources (AECL)	A. No single source to exceed 16,000 curies	
B. Cobalt 60	B. Sealed Sources (AECL)	B. No single source to exceed 1,500 curies	
C. Cesium 137	C. Sealed Sources (AECL Model C-161-type 8)	C. 4,200 curies (No single source to exceed 2100 curies)	
<b>9. Authorized use</b>			
A. To be used in AECL Gammacell 220 irradiator located in Room 48, Building 40, WRAIR, Washington, D. C., for medical research and development and radiation dosimetry.			
B. To be used in AECL Gammacell 220 Irradiator located in Building 500, Forest Glen Section, WRAMC, Montgomery County, Maryland, for medical research and development and radiation dosimetry.			
C. To be used in AECL Gammacell 40 Irradiator located in Room 48, Building 40, WRAIR, Washington, D. C., for small animal irradiation, medical research, development, and radiation dosimetry.			

X/14

MATERIALS LICENSE

Supplementary Sheet

License Number 08-01738-03

Docket or

Reference No. \_\_\_\_\_

Amendment No. 13

CONDITIONS

10. The licensee shall comply with the provisions of Title 10, Chapter 1, Code of Federal Regulations, Part 19, "Notices, Instructions and Reports to Workers; Inspections" and Part 20, "Standards for Protection Against Radiation."
11. Licensed material shall be used by, or under the supervision of, individuals designated by the Isotope Committee, Commanding General, Walter Reed Army Medical Center, Chairman.
12. A. Each sealed source containing licensed material shall be tested for leakage and/or contamination at intervals not to exceed six months. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, a sealed source received from another person shall not be put into use until tested.  
B. The test shall be capable of detecting the presence of 0.05 microcurie of contamination on the test sample. The test samples shall be taken from appropriate accessible surfaces of the device in which the sealed source is permanently or semipermanently mounted or stored. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission.  
C. If the test reveals the presence of 0.05 microcurie or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Commission regulations. A report shall be filed within 5 days of the test with the U.S. Nuclear Regulatory Commission, Region I, Office of Inspection and Enforcement, 631 Park Avenue, King of Prussia, Pennsylvania 19406, describing the equipment involved, the test results, and the corrective action taken.  
D. Tests for leakage and/or contamination shall be performed by, or under the supervision of, individuals designated by the Isotope Committee, Commanding General, Walter Reed Army Medical Center, Chairman.

MATERIALS LICENSE

Supplementary Sheet

License Number 08-01738-03

Docket or  
Reference No. \_\_\_\_\_

**Amendment No. 13**

CONDITIONS

(Continued)

- 13. Written administrative instructions entitled, "Operation and Safety Procedures to be Followed for AECL Gammacell 220 Irradiator", and "Operation and Safety Procedures to be Followed for Small Animal Irradiator", both dated March 25, 1965, as amended by letter dated June 22, 1965, AECL Gammacell 220 Radiation Protection Survey dated May 30, 1975, and "Operation and Safety Procedures to be Followed for AECL Gammacell 220 Irradiator", dated June 17, 1975, shall be followed and a copy of these instructions shall be made available to each individual using or having responsibility for use of licensed material. Any changes in these instructions shall have the prior approval of the Materials Branch, Division of Materials and Fuel Cycle Facility Licensing, U. S. Nuclear Regulatory Commission.
- 14. The licensee is authorized to remove two (2) sealed sources from the small animal irradiator to facilitate repair to the irradiator. This operation may be repeated with two (2) other sealed sources of the irradiator when the two (2) preceding sources have been safely returned to the small animal irradiator. Source removal and replacement shall be in accordance with the statements, representations, and procedures contained in the enclosures with the letter dated August 28, 1963, signed by W. V. Davis, letter dated November 22, 1963, signed by W. V. Davis, and the enclosures with the letter dated November 22, 1963, signed by W. V. Davis.
- 15. Except as specifically provided otherwise by this license, the licensee shall possess and use licensed material described in Subitems 6.C., 7.C., and 8.C. of this license in accordance with statements, representations, and procedures contained in letter dated July 18, 1972, signed by LTC James A. Phillips and operating procedures dated November 1, 1972 and as submitted with letter dated December 29, 1972 and Items 6, 7, and 8 in accordance with application and attachments thereto dated May 31, 1975.

Date OCT 17 1975

For the U. S. Nuclear Regulatory Commission

ORIGINAL SIGNED BY

*MW*  
by 10/16/75  
MELVIN W. SHUPE  
Materials Branch

Division of Materials and Fuel Cycle  
Facility Licensing  
Washington, D. C. 20555

*MS/Sc 2/75*

MATERIALS LICENSE

Supplementary Sheet

License Number 08-01738-03

Department of the Army  
Walter Reed Army Medical Center  
Washington, D. C. 20012

Docket or  
Reference No. \_\_\_\_\_

Amendment No. 14

In accordance with application dated April 4, 1979, License Number 08-01738-03 is amended as follows:

Items 6., 7., 8., and 9. are amended to read:

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. Cobalt 60	A. Sealed Sources (AECL Models C-166, C-167 or C-198)	A. No single source to exceed 16,000 curies
B. Cobalt 60	B. Sealed Sources (AECL Models C-166, C-167, or C-198)	B. No single source to exceed 1,500 curies
C. Cesium 137	C. Sealed Sources (AECL Model C-161-Type 8)	C. No single source to exceed 2,100 curies
D. Cobalt 60	D. Sealed Sources (AECL Model C-166, C-167 or C-198)	D. No single source to exceed 26,400 curies
E. Cesium 137	E. Sealed Sources (AECL Model C-161 Type 8)	E. No single source to exceed 2,100 curies

9. Authorized use

- A. To be used in AECL Gammacell 220 irradiator located in Room 48, Building 40, WRAIR, Washington, D. C., for medical research and development and radiation dosimetry.
- B. To be stored in AECL Gammacell 220 Irradiator located in Building 500, Forest Glen Section, WRAMC, Montgomery County, Maryland, for medical research and development and radiation dosimetry.
- C. To be used in AECL Gammacell 40 Irradiator located in Room 48, Building 40, WRAIR, Washington, D. C., for small animal irradiation, medical research, development and radiation dosimetry.

X/15



JUL 6 1980

Department of the Army  
Walter Reed Army Medical Center  
ATTN: Barnard J. Mittermayer, MD  
Major General, MC  
Commanding  
Washington, D.C. 20012

LICENSE NO. 02-01792-03

CONTROL NO. 04016

DOCKET NO. 030-06895

SUBJECT: LICENSE RENEWAL APPLICATION

Gentlemen:

This is to acknowledge receipt of your application for renewal of the material(s) license identified above. Your application is deemed timely filed, and accordingly, the license will not expire until final action has been taken by this office.

Any correspondence regarding the renewal application should reference the control number specified and your license number.

Sincerely,

Loch Trempor  
Material Licensing Branch  
Division of Fuel Cycle and  
Material Safety

8009 030370

X/16



DEPARTMENT OF THE ARMY  
WALTER REED ARMY MEDICAL CENTER  
WASHINGTON, D.C. 20012

REPLY TO  
ATTENTION OF:

JUL 18 1980

HSWP-QHP

SUBJECT: Renewal of US Nuclear Regulatory Commission License No.  
08-01738-03

THRU: TSG HQDA (DASG-PSP-E)  
Washington, DC 20310

*18 Jul 80*  
ROBERT T. WANGEMANN  
Colonel, MSC  
Radiological Hygiene Consultant

TO: Director  
Division of Fuel Cycle and Material Safety  
Office of Nuclear Material Safety and Safeguards  
US Nuclear Regulatory Commission  
Washington, DC 20555

Enclosed are two copies of application for renewal of USNRC License No.  
08-01738-03 for Walter Reed Army Medical Center.

FOR THE COMMANDER:

1 Incl  
as (dupe)

*Patrick J. Mumma*  
PATRICK J. MUMMA  
MAJ, MSC  
Adjutant General

CF: CDR, HSC, ATTN: HSPA-P  
CDR, USAEHA, ATTN: HSE-RH

*Rec. 7/29/80*

REC'D

COPIES SENT TO OFF. OF  
INSPECTION AND ENFORCEMENT

*X/17*

04615

CONVERSATION RECORD

TIME 2:11 PM

DATE Aug 18 1960

TYPE

VISIT

CONFERENCE

TELEPHONE

INCOMING

OUTGOING

ROUTING

NAME/SYMBOL	INT

Location of Visit/Conference:

NAME OF PERSON(S) CONTACTED OR IN CONTACT WITH YOU

Cpt. D.A. Stevenson

ORGANIZATION (Office, dept., bureau, etc.)

Walter Reed Army Medl.

TELEPHONE NO.

(301) 427-5104

SUBJECT

08-01738-03 - Called to Clarify Info in the renewal Applin

SUMMARY

Q: Please reconcile existing Lic with 5 Irradiators and renewal which includes 4 irradiators

A: Irrad. Item 6.B. has been disposed of and only 4 are now possessed.

Q. Do you plan to do any source rod changing, yourself or would you bring in the supplier

A. Do not contemplate any rod changing (as had been done long time ago); do not contemplate need -- if there is a need the vendor would be called in.

ACTION REQUIRED

prepare renewal documents

NAME OF PERSON DOCUMENTING CONVERSATION

G. Kligfield

SIGNATURE

G. Kligfield

DATE

8/18/60

ACTION TAKEN

SIGNATURE

TITLE

DATE

X/18

**S. NUCLEAR REGULATORY COMMISSION  
MATERIALS LICENSE**

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 1, Parts 30, 31, 32, 33, 34, 35, 36, 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); and to import such byproduct and source material. 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.

<p><b>Licensee</b></p> <p>1. Department of the Army Walter Reed Army Medical Center</p> <p>2. Washington, D. C. 20012</p>		<p>In accordance with application dated July 18, 1980</p> <p>3. License number <b>08-01738-03</b> is amended in its entirety to read as follows:</p>	
		<p>4. Expiration date <b>August 31, 1985</b></p>	
		<p>5. Docket or Reference No. <b>030-06895</b></p>	
<p>6. Byproduct, source, and/or special nuclear material.</p> <p>A. Cobalt 60</p> <p>B. Cesium 137</p> <p>C. Cobalt 60</p> <p>D. Cesium 137</p>	<p>7. Chemical and/or physical form</p> <p>A. Sealed sources (AECL Models C-166, C-167 or C-198)</p> <p>B. Sealed sources (AECL Model C-161 Type 8)</p> <p>C. Sealed sources (AECL Model C-198)</p> <p>D. Sealed sources (AECL Model C-161 Type 8)</p>	<p>8. Maximum amount that licensee may possess at any one time under this license</p> <p>A. No single source to exceed 16,000 curies</p> <p>B. 2 sources not to exceed 2,100 curies each Total 4,200 curies</p> <p>C. No single source to exceed 26,400 curies</p> <p>D. 2 sources not to exceed 2,100 curies each Total 4,200 curies</p>	
<p>9. Authorized use</p> <p>A. To be used in AECL Gammacell 220 irradiator located in Room E-099, Building 40, WRAIR, Washington, D. C., for medical research and development and radiation dosimetry.</p> <p>B. To be used in AECL Gammacell 40 Irradiator located in Room E-099, Building 40, WRAIR, Washington, D. C., for small animal irradiation, medical research, development and radiation dosimetry.</p>			

X/19

MATERIALS LICENSE

Supplementary Sheet

License Number 08-01738-03

Docket or  
Reference No. \_\_\_\_\_  
Amendment No. 15

9. Authorized use continued

- C. To be used in AECL Gammacell 220 Irradiator located in Building 1425, Room AA413, U. S. Army Research Institute of Infectious Diseases, Fort Detrick, Frederick, Maryland, for medical research and development and radiation dosimetry.
- D. To be used in AECL Gammacell 40 Irradiator located in Building 1425, Room AA413, U. S. Army Research Institute of Infectious Diseases, Fort Detrick, Frederick, Maryland, for medical research and development and radiation dosimetry.

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CONDITIONS

- 10. The licensee shall comply with the provisions of Title 10, Chapter 1, Code of Federal Regulations, Part 19, "Notices, Instructions and Reports to Workers; Inspections" and Part 20, "Standards for Protection Against Radiation."
- 11. Licensed material shall be used by, or under the supervision of, individuals designated by the individual approved by the Radiation Control Committee, Walter Reed Army Medical Center.
- 12. A. Each sealed source containing licensed material shall be tested for leakage and/or contamination at intervals not to exceed six months. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, a sealed source received from another person shall not be put into use until tested.
  - B. The test shall be capable of detecting the presence of 0.05 microcurie of contamination on the test sample. The test samples shall be taken from appropriate accessible surfaces of the device in which the sealed source is permanently or semipermanently mounted or stored. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission.
  - C. If the test reveals the presence of 0.05 microcurie or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Commission regulations. A report shall be filed within 5 days of the test with the U. S. Nuclear Regulatory Commission, Region I, Office of Inspection and Enforcement, 631 Park Avenue, King of Prussia, Pennsylvania 19406, describing the equipment involved, the test results, and the corrective action taken.
  - D. Tests for leakage and/or contamination shall be performed by the individuals approved by the Radiation Control Committee, Walter Reed Army Medical Center or by other persons specifically authorized by the Commission or an Agreement State to perform such services.

MATERIALS LICENSE

Supplementary Sheet

License Number 08-01738-03

CONDITIONS

Docket or  
Reference No. \_\_\_\_\_

Amendment No. 15

(continued)

- 13. Written instructions contained in application dated July 18, 1980 shall be followed and a copy of these instructions shall be made available to each individual using or having responsibility for use of licensed material. Any changes these instructions shall have the prior approval of the Material Licensing Branch, Division of Fuel Cycle and Material Safety, U.S. Nuclear Regulatory Commission, Washington, D. C. 20555.
- 14. This license does not authorize repairs or alterations of the irradiator involving removal of shielding or access to the licensed material except as provided otherwise by specific condition of this license. Removal, replacement and disposal of sealed sources shall be performed only by the AECL or by other persons specifically authorized by the Commission or an Agreement State to perform such activities.
- 15. Except as specifically provided otherwise by this license, the licensee shall possess and use licensed material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in application dated July 18, 1980. The Nuclear Regulatory Commission's regulations shall govern the licensee's statements in applications or letters, unless the statements are more restrictive than the regulations.

SEP 08 1980

Date \_\_\_\_\_

For the U.S. Nuclear Regulatory Commission

JOSEPH

by \_\_\_\_\_  
Material Licensing Branch

Division of Fuel Cycle and  
Material Safety  
Washington, D.C. 20555

*Kingfield 9/5 jrb*

*CFWA*

INSPECTION FINDINGS AND LICENSEE ACKNOWLEDGMENT

<b>1. LICENSEE</b> Department of the Army Walter Reed Army Medical Center Washington, D.C. 20012		<b>2. REGIONAL OFFICE</b> U.S. Nuclear Regulatory Commission Region I 631 Park Avenue King of Prussia, Pennsylvania 19406	
<b>3. DOCKET NUMBER(S)</b> 30-6895		<b>4. LICENSE NUMBER(S)</b> 08-01738-03	<b>5. DATE OF INSPECTION</b> 10/7/80
<b>6. INSPECTION FINDINGS</b> The inspection was an examination of the activities conducted under your license as they relate to radiation safety and to compliance with the Commission's rules and regulations and the conditions of your license. The inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations by the inspector. The findings as a result of this inspection are as follows:			
<input type="checkbox"/> No items of noncompliance or unsafe conditions were found.			
The following items of noncompliance related to records, signs, and labels were found:			
<input type="checkbox"/> A. Rooms or areas were not properly posted to indicate the presence of a RADIATION AREA. 10 CFR 20.203(b) or 34.42			
<input type="checkbox"/> B. Rooms or areas were not properly posted to indicate the presence of a HIGH RADIATION AREA. 10 CFR 20.203(c) (1) or 34.42			
<input type="checkbox"/> C. Rooms or areas were not properly posted to indicate the presence of an AIRBORNE RADIOACTIVITY AREA. 10 CFR 20.203(d)			
<input type="checkbox"/> D. Rooms or areas were not properly posted to indicate the presence of RADIOACTIVE MATERIAL. 10 CFR 20.203(e)			
<input type="checkbox"/> E. Containers were not properly labeled to indicate the presence of RADIOACTIVE MATERIAL. 10 CFR 20.203(f) (1) or (f) (2)			
<input type="checkbox"/> F. A current copy of 10 CFR 20, a copy of the license, or a copy of the operating procedures was not properly posted or made available. 10 CFR 20.206(b)			
<input type="checkbox"/> G. Form NRC-3 was not properly posted. 10 CFR 20.206(c)			
<input type="checkbox"/> H. Records of the radiation exposure of individuals were not properly maintained. 10 CFR 20.401(a) or 34.33(b)			
<input type="checkbox"/> I. Records of surveys or disposals were not properly maintained. 10 CFR 20.401(b) or 34.43(d)			
<input type="checkbox"/> J. Records of receipt, transfer, disposal, export or inventory of licensed material were not properly maintained. 10 CFR 30.51, 40.61 or 70.51			
<input checked="" type="checkbox"/> K. Records of leak tests were not maintained as prescribed in your license, or 10 CFR 34.25(c)			
<input type="checkbox"/> L. Records of inventories were not maintained. 10 CFR 34.26			
<input type="checkbox"/> M. Utilization logs were not maintained. 10 CFR 34.27			
<input type="checkbox"/> N. Records of radiation survey instrument calibration were not maintained. 10 CFR 34.24			
<input type="checkbox"/> O. Records of teletherapy electrical interlock tests were not maintained as prescribed in your license.			
<input type="checkbox"/> P. Other _____			
_____ (NRC Inspector)			
7. The NRC Inspector has explained and I understand the items of noncompliance listed above. The items of noncompliance will be corrected within the next 30 days.			
7 OCT 80 (Date)		_____ (Licensee Representative - Title or Position)	

ORIGINAL TO LICENSEE

8011120610

X/20

HEALTH PHYSICS OFFICER  
RADIATION PROTECTION OFFICER

INSPECTION REPORT NO. 80-01

Attached

Department of the Army  
Walter Reed Medical Center  
Washington, DC 20012

- Appendix A
- Appendix B
- Appendix C
- Memo

Licensee contact: Cpt. Dennis Stevenson Telephone no. 301-427-5107

License no. 08-01738-03 Last amendment and date: 15- ?

Category: G1, and Priority: 3, as of last amendment.

Inspection date(s): 10/7/80 Type of inspection: Routine Unannounced

SUMMARY OF FINDINGS AND ACTION

- No noncompliance, clear 591 issued
- Noncompliance, 591 issued
- Noncompliance, Appendix A
- Regional action
- Action on previous noncompliance, Appendix B
- Hq action
- Supplemental info, Appendix C

RECOMMENDATIONS

See basis in Appendix C or attached memo.

- Change Category to: E
- Change Priority to: 1
- Next inspection date: 10/83

PERSONS CONTACTED

Cpt. Dennis Stevenson, PSO

James Stafford, HP

Cpt. Virbanski, Researcher

Sgt. Beckwith, Radiation Monitor

Inspector: [Signature]

Approved: [Signature]

X2  
10/10/80  
10-20-80

Plan Approved: \_\_\_\_\_

Date: \_\_\_\_\_

Licensee: \_\_\_\_\_

License No: \_\_\_\_\_

Inspection Items	Scheduled for Inspection	Post-Inspection Status	Module No.	766 Time Info
Management Meeting - Entrance and Exit Interviews (Required)	✓	Complete	30703B	10 min
Program Requirements, MC 2850 (Required)	✓	Complete	77710B	2 hrs
Followup on Noncompliance and Deviations			92702B	
Independent Inspection Effort (Required)	✓	Complete	92706B	2 hrs
Transportation	—	—	86740B	—
Licensee Event Followup			92700B	
Followup on Inspector-Identified Problems			92701B	
IE Bulletin/Immediate Action Letter Followup			92703B	
Followup on Headquarters Requests			92704B	
Followup on Regional Requests			92705B	
Inspector Dispatched to Site			93700B	
Followup on Significant Event Occurring During Inspection			93701B	
Initial Management Meeting			38800B	

AREAS INSPECTED AND FINDINGS

Licensee: \_\_\_\_\_ License no: \_\_\_\_\_ Amendment no: \_\_\_\_\_

INSPECTION ITEMS	CRITERIA	FINDING
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<p>1. <u>Organization</u>                      Management organization.                      Radiation protection organization.</p>	<p>Lic Cond <u>15</u></p>	<p><u>C</u></p>
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NOTES & REMARKS:

<p>2. <u>Licensee internal audits</u>                      Scope and frequency.                      Management controls.</p>	<p>Lic Cond <u>15</u></p>	<p><u>C</u></p>
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NOTES & REMARKS:

<p>3. <u>Training and instructions to employees</u>                      Training program, scope and frequency, retraining.                      Required tests administered; scores satisfactory.                      Instructions to workers.</p>	<p>Lic C                      Lic Cond <u>15</u>                      19.12</p>	<p><u>C</u></p>
--	---	-----------------

NOTES & REMARKS:

<p>4. <u>Radiation protection procedures</u>                      Operating &amp; emergency procedures implemented.                      Security.</p>	<p>Lic Cond <u>15</u>                      20.207</p>	<p><u>C</u></p>
--	---	-----------------

NOTES & REMARKS:



## AREAS INSPECTED AND FINDINGS

Licensee: \_\_\_\_\_ License no: \_\_\_\_\_ Amendment no: \_\_\_\_\_

INSPECTION ITEM	CRITERIA	FINDING
<u>9. Effluent control, waste disposal</u>		
Release of effluents.	20.106	C
Waste disposal.	20.301, 20.303, 20.304, 20.305	
Procedures, records.	20.401, Lic Cond _____	
<u>NOTES &amp; REMARKS:</u>		
<hr/>		
<u>10. Shipping, shipping incidents</u>		
Procedures for pickup, receipt, monitoring of packages.	20.205(b) & (c)	C
Transportation of licensed material.	71.5	
Incidents, reports, corrective actions.	49CFR 170-189	
<u>NOTES &amp; REMARKS:</u>		
<hr/>		
<u>11. Notifications and reports</u>		
To individuals.	19.13	C
Overexposures, excessive levels & concentrations, incidents.	20.403, 20.405	
Personnel exposures and monitoring, termination reports.	20.407, 20.408	
Theft or loss of licensed material.	20.402	
<u>NOTES &amp; REMARKS:</u>		
<hr/>		
<u>12. Posting of notices</u>		
Part 20, license & documents, procedures, notice of violations.	19.11(a)	C
NRC-3.	19.11(c)	
<u>NOTES &amp; REMARKS:</u>		

AREAS INSPECTED AND FINDINGS

Licensee: \_\_\_\_\_ License no: \_\_\_\_\_ Amendment no: \_\_\_\_\_

INSPECTION ITEM	CRITERIA	FINDING
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13. <u>Environmental monitoring program</u>	Lic Cond _____	_____
<p>Implementation of program, scope and frequency as required.  Records maintained, reviewed by management.</p>		
NOTES & REMARKS:		

N/A

14. <u>Emergency preparedness</u>	Lic Cond _____	_____
<p>Procedures available for incidents and accidents.  Training for personnel; coordination with supporting groups and agencies.</p>		
NOTES & REMARKS:		

N/A

15. <u>Other license conditions</u>	Lic _____	_____
NOTES & REMARKS:		

16. <u>Confirmatory measurements</u> Licensee's surveys verified on sampling basis.	20.105, 20.201	E
NOTES & REMARKS:		

17. <u>Independent inspection effort:</u>		E
NOTES & REMARKS:		

APPENDIX A - DOCUMENTATION OF NONCOMPLIANCE

Licensee: \_\_\_\_\_

License no: \_\_\_\_\_

Reference	Basis for noncompliance
Report item <u>8</u> 10 CFR _____ Lic Cond <u>12.B.</u> Type n/c <u>SL II</u>	<p>The two irradiators at Fort Detrick supposedly had been leak tested in March 1980 but no record of the tests could be found. There were records of leak tests conducted in September 1980.</p>
Report item _____ 10 CFR _____ Lic Cond _____ Type n/c _____	
Report item _____ 10 CFR _____ Lic Cond _____ Type n/c _____	
Report item _____ 10 CFR _____ Lic Cond _____ Type n/c _____	
Report item _____ 10 CFR _____ Lic Cond _____ Type n/c _____	

LICENSE NO: 08-01738-03

DOCKET NO. (s) 030-06895

PAGE \_\_\_\_\_ OF \_\_\_\_\_

ATTACHED

- Appendix A
- Appendix B
- Appendix C
- Memo

INSPECTION REPORT NO. 84-01

Dept. of the Army  
Walter Reed Army Medical Center  
Washington, D.C. 20012

LICENSEE CONTACT: Col. Woodward Telephone No: (202) 576-1100

LICENSE NO: 08-01738-03 CATEGORY E PRIORITY: 3

CATEGORY \_\_\_\_\_ PRIORITY: \_\_\_\_\_

CATEGORY \_\_\_\_\_ PRIORITY: \_\_\_\_\_

INSPECTION DATE (s): August 15, 1984 TYPE OF INSPECTION:  SPECIAL  ANNOUNCED  
 ROUTINE  UNANNOUNCED  
 DAYSHIFT  
 OTHER

SUMMARY OF FINDINGS AND ACTION

- NO NONCOMPLIANCE, CLEAR 591 ISSUED
- NO NONCOMPLIANCE, LETTER
- NONCOMPLIANCE, APPENDIX A

- ACTION ON PREVIOUS NONCOMPLIANCE, APPENDIX B
- NONCOMPLIANCE, 591 ISSUED
- SUPPLEMENTAL INFO, APPENDIX C

RECOMMENDATIONS  
SEE BASIS IN APPENDIX C

CHANGE CATEGORY TO: \_\_\_\_\_  
 NEXT INSPECTION DATE: 08/87

CHANGE PRIORITY TO: \_\_\_\_\_

PERSONS CONTACTED

Col. Woodward  
Lt. Col. Allvercht  
James Stafford  
Spec. Lewis  
Major Gerald Corrock  
John Kvoerl

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

INSPECTOR: Claude A. Howe

Marlene J. Taylor X/22

APPROVED: J. Costello for [Signature] 9/6/84

INSPECTION PLAN AND REPORT NUMBER \_\_\_\_\_

Page \_\_\_\_\_ of \_\_\_\_\_

Plan Approved: \_\_\_\_\_

Date: \_\_\_\_\_

Licensee: \_\_\_\_\_

License No. \_\_\_\_\_

Inspection Items	Scheduled for Inspection	Post Inspection Status	Module No.
Management Meeting - Entrance and Exit Interviews (Required)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	30703B
Program Requirements, MC 2850 (Required)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	77710B
Followup on Noncompliance and Deviations	<input type="checkbox"/>	<input type="checkbox"/>	92702B
Independent Inspection Effort (Required)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	92706B
Transportation	<input type="checkbox"/>	<input type="checkbox"/>	86740B

INSPECTION REPORT NUMBER \_\_\_\_\_

Page \_\_\_\_\_ of \_\_\_\_\_

77710B - Irradiator

AREAS INSPECTED AND FINDINGS

Licensee: \_\_\_\_\_ License No: \_\_\_\_\_ Amendment No: \_\_\_\_\_

INSPECTION ITEMS	CRITERIA	FINDING
<p>1. <u>Organization</u></p> <p>Management organization?</p> <p>Radiation protection organization?</p> <p>Scope of program?</p>	Lic Cond <u>15</u>	<u>C</u>
<p>NOTES &amp; REMARKS: The Health Physics Office Operations Branch is responsible for the training of personnel, leak test being done, and handling of waste. They have 2 irradiators a Co-60 and a Cs-137 located in B-099, Building 40, WRAMC. The waste is stored in Rm B-079 of the lower.</p>		
<p>2. <u>Licensee Internal Audits</u></p> <p>Scope and frequency?</p> <p>Management controls?</p>	Lic Cond <u>15</u>	<u>C</u>
<p>NOTES &amp; REMARKS: The Health Physics Office conducts audits while they are performing their routine surveys</p>		
<p>3. <u>Training and Instructions to Employees</u></p> <p>Training program, scope and frequency, retraining?</p> <p>Required tests administered; scores satisfactory?</p> <p>Instructions to workers?</p>	Lic Cond <u>15</u>	<u>C</u>
<p>NOTES &amp; REMARKS: A posting of the TRAINED AUTHORIZED USERS is post on the irradiator and also outside the area in which the irradiators are kept.</p>		
<p>4. <u>Radiation Protection Procedures</u></p> <p>Operating &amp; emergency procedures implemented?</p> <p>Security?</p>	Lic Cond <u>15</u>	<u>C</u>
<p>NOTES &amp; REMARKS: The irradiators are kept in a room that is part of Rm B-099. This door was posted and had a lock on it. There is also a log book outside the room in which the person using the irradiators has to log in.</p>		

1. SAME building: According to the log that the INSPECTORS REVIEWED THE IRRADIATORS ARE USED almost every day.

DATE

TIME

LOCATION

11/10/68

12:00 PM

Room 100

INSPECTOR'S NAME

INSPECTOR'S TITLE

... the log that the inspectors reviewed the irradiators are used almost every day. ...

11/10/68

12:00 PM

Room 100

INSPECTOR'S NAME

INSPECTOR'S TITLE

... the log that the inspectors reviewed the irradiators are used almost every day. ...

11/10/68

12:00 PM

Room 100

INSPECTOR'S NAME

INSPECTOR'S TITLE

... the log that the inspectors reviewed the irradiators are used almost every day. ...

11/10/68

12:00 PM

Room 100

INSPECTOR'S NAME

INSPECTOR'S TITLE

... the log that the inspectors reviewed the irradiators are used almost every day. ...

## AREAS INSPECTED AND FINDINGS

Licensee: \_\_\_\_\_ License No: \_\_\_\_\_ Amendment No: \_\_\_\_\_

INSPECTION ITEM	CRITERIA	FINDING
<b>5. <u>Materials, Facilities and Instruments</u></b>		
Authorized uses and quantities?	Lic Cond _____	<u>C</u>
Restricted areas, posting requirements?	20.203	
Survey instruments & dosimeters; operable, properly calibrated?	Lic Cond _____	
Independent area radiation monitor?	N/A	
Survey meter used on entering HRA?		
NOTES & REMARKS: They have 2 irradiators Co-60 and Cs-137 which are basic used for research. The room that they are located in is posted and equipped with a lock. The inspectors also saw a pack of dosimetry badges outside the irradiator room.		
<b>6. <u>Receipt and Transfer of Materials</u></b>		
Procedures implemented, adequate?	20.205, 71.51	<u>N/A</u>
Transfer of byproduct material?	30.41	
Control of source material, SNM?	40.51, 40.64, 70.42, 70.51, 70.53, 70.54	
Records of receipt, transfer, storage, survey and monitoring?	30.51	
NOTES & REMARKS:		
<b>7. <u>Control of High Radiation Area</u></b>		
Interlocks, tests, entry control?	20.203(c)(6)	<u>N/A</u>
Action if entry control device fails?		
Device to prevent source exposure with individual in chamber?		
Level control for liquid shield?		
Source exposure procedure?		
Control of portals (continuous irradiator)?		
NOTES & REMARKS:		

77710B - Irradiator

## AREAS INSPECTED AND FINDINGS

Licensee: \_\_\_\_\_ License No: \_\_\_\_\_ Amendment No: \_\_\_\_\_

INSPECTION ITEM	CRITERIA	FINDING
<u>8. Transportation</u>		<u>N/A</u>
Management controls, audits?		
Selection of packaging?	49 CFR 173.393-5, 10 CFR 71	
Preparation of packages for shipment?	49 CFR 172, 173	
Filling, loading, closing, liquids?	49 CFR 172, 300	
Markings & labelling?	49 CFR 172.403, 402	
Monitoring?	49 CFR 173.393	
Shipping papers, loading & placarding of vehicles?	49 CFR 172.200	
Reports of Incidents?		
Examination of packages?		
NOTES & REMARKS:		
<u>9. Personnel Protection- External</u>		<u>C</u>
Personnel monitoring control; minimize exposures, control of accumulated dose?	20.101, 20.102, 20.202	
Surveys conducted, adequate?	20.201	
Records of monitoring, surveys, disposals?	20.401, Lic Cond _____	
Levels in unrestricted areas?	20.1, 20.105	
NOTES & REMARKS:	THE INSPECTORS SAW A RACK CONTAINING FILM BADGES LOCATED OUTSIDE THE IRRADIATOR ROOM DOOR. THE INSPECTORS ALSO REVIEWED EXPOSURE RECORDS AND FOUND THE EXPOSURES TO BE WELL WITHIN REGULATORY LIMITS.	
<u>10. Personnel Protection - Internal</u>		<u>C</u>
Airborne concentrations in restricted areas?	20.103	
Exposure of minors?	20.104	
Posting of airborne radioactivity areas?	20.203	
Survey, monitoring, bioassay requirements; records?	20.201, 20.401	
Leak tests of sealed sources?	Lic Cond <u>12</u>	
NOTES & REMARKS:	THE INSPECTORS ALSO REVIEWED THE LEAK TEST REPORTS. THE REPORTS SHOWED THAT THE LEAK TESTS WERE CONDUCTED EVERY 6 MONTHS. THE RESULTS FOR THESE TESTS WERE WELL WITHIN REGULATORY LIMITS.	

## AREAS INSPECTED AND FINDINGS

Licensee: \_\_\_\_\_ License No: \_\_\_\_\_ Amendment No: \_\_\_\_\_

INSPECTION ITEM	CRITERIA	FINDING
<b>11. <u>Effluent Control, Waste Disposal</u></b>		<u>N/A</u>
Release of effluents?	20.106	
Waste disposal, proper packaging for shipment?	20.301, 20.303, 20.304, 20.305	
Procedures, records?	20.401, Lic Cond _____	
NOTES & REMARKS:		

<b>12. <u>Shipping, Shipping Incidents</u></b>		<u>N/A</u>
Procedures for pickup, receipt, monitoring of packages?	20.205(b) & (c)	
Incidents, reports, corrective actions?	49 CFR 170-189	
NOTES & REMARKS:		

<b>13. <u>Notifications and Reports</u></b>		<u>C</u>
To individuals?	19.13	
Overexposures, excessive levels & concentrations, incidents?	20.403, 20.405	
Personnel exposures and monitoring, termination reports?	20.407, 20.408	
Theft or loss of licensed material?	20.402	

NOTES & REMARKS: According to Col. Woodward and Jim Stafford they have never had a theft or loss of material. In reviewing the exposure records inspectors saw that none of the personnel have had an over exposure or an excessive exposure level.

<b>14. <u>Posting of Notices</u></b>		<u>C</u>
Part 20, license & documents, procedures, notice of violations?	19.11(a)	
NRC-37	19.11(c)	
NOTES & REMARKS: The necessary postings WERE in the laboratory.		

AREAS INSPECTED AND FINDINGS

Licensee: \_\_\_\_\_ License No: \_\_\_\_\_ Amendment No: \_\_\_\_\_

INSPECTION ITEM	CRITERIA	FINDING
15. <u>Environmental Monitoring Program</u>	Lic Cond _____	<u>N/A</u>
Implementation of program, scope and frequency as required?		
Records maintained, reviewed by management?		
NOTES & REMARKS:		

16. <u>Emergency Preparedness</u>	Lic Cond _____	<u>C</u>
Procedures available for incidents and accidents?		
Training for personnel; coordination with supporting groups and agencies?		
NOTES & REMARKS:		

Procedures were made available to the employees. Procedures were also posted in the laboratory. Employees were able to tell the inspectors the procedures to follow if there happened to be a problem.

17. <u>Other License Conditions</u>		<u>N/A</u>
NOTES & REMARKS:		

18. <u>Confirmatory Measurements</u>		<u>N/A</u>
Licensee's surveys verified on sampling basis?	20.105, 20.201	
Analysis of pool water sample?		
NOTES & REMARKS:		

NRC Instrument: Rudlum 3 Calibration Due Date: 10/31/84  
 SERIAL # 11432 NRC # 007764

19. <u>Independent Inspection Effort</u>		
NOTES & REMARKS:		

The inspectors checked on the waste storage area of building 4. This was to follow up on a phone call that was received from John Kinneman expressing some concern with the area. The inspectors found no safety problems in the area. A survey of the area showed that it was less than 1mR/hr. Col. Woodard and Mr. Stafford said that they have been having problems with

RESEARCH REPORT

PROJECT TITLE \_\_\_\_\_  
RESEARCHER'S NAME \_\_\_\_\_  
DATE OF SUBMISSION \_\_\_\_\_

19. ONE OF THE RESEARCHERS WORKING THERE. They said that she would like to take over the area in which the waste is stored AND has tried SEVERAL ways in which to accomplish this. They feel that she has called the NRC and expressed some concern over this area hoping that there would be some problem and that she would be able to eventually use the room.

RESEARCHER'S NAME \_\_\_\_\_  
DATE OF SUBMISSION \_\_\_\_\_

RESEARCHER'S NAME \_\_\_\_\_  
DATE OF SUBMISSION \_\_\_\_\_

INSPECTION REPORT NUMBER \_\_\_\_\_

Page \_\_\_\_\_ of \_\_\_\_\_

APPENDIX A - DOCUMENTATION OF NONCOMPLIANCE

Licensee: \_\_\_\_\_

License No: \_\_\_\_\_

Reference	Basis for noncompliance
Report item _____ 10 CFR _____ Lic Cond _____ Type n/c _____	
Report item _____ 10 CFR _____ Lic Cond _____ Type n/c _____	
Report item _____ 10 CFR _____ Lic Cond _____ Type n/c _____	
Report item _____ 10 CFR _____ Lic Cond _____ Type n/c _____	
Report item _____ 10 CFR _____ Lic Cond _____ Type n/c _____	
Report item _____ 10 CFR _____ Lic Cond _____ Type n/c _____	

APPENDIX B - LICENSEE ACTION ON PREVIOUS INSPECTION FINDINGS

Licensee: \_\_\_\_\_

License No: \_\_\_\_\_

---

Identification and summary of action taken	Status
--	--------

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Report No: \_\_\_\_\_ Type n/c: \_\_\_\_\_ Describe: \_\_\_\_\_

Action taken: \_\_\_\_\_  
OPEN  
CLOSED

---

Report No: \_\_\_\_\_ Type n/c: \_\_\_\_\_ Describe: \_\_\_\_\_

Action taken: \_\_\_\_\_  
OPEN  
CLOSED

---

Report No: \_\_\_\_\_ Type n/c: \_\_\_\_\_ Describe: \_\_\_\_\_

Action taken: \_\_\_\_\_  
OPEN  
CLOSED

---

Report No: \_\_\_\_\_ Type n/c: \_\_\_\_\_ Describe: \_\_\_\_\_

Action taken: \_\_\_\_\_  
OPEN  
CLOSED

---

Report No: \_\_\_\_\_ Type n/c: \_\_\_\_\_ Describe: \_\_\_\_\_

Action taken: \_\_\_\_\_  
OPEN  
CLOSED

---

Report No: \_\_\_\_\_ Type n/c: \_\_\_\_\_ Describe: \_\_\_\_\_

Action taken: \_\_\_\_\_  
OPEN  
CLOSED

---

INSPECTION REPORT NUMBER \_\_\_\_\_

Page \_\_\_\_\_ of \_\_\_\_\_

APPENDIX C - SUPPLEMENTARY INFORMATION

Licensee: \_\_\_\_\_ License No: \_\_\_\_\_

- 
- |   |   |
|---|---|
| <input type="checkbox"/> Uncorrected/repeated noncompliance       | <input type="checkbox"/> Unresolved items     |
| <input type="checkbox"/> Unusual occurrence, conditions, etc      | <input type="checkbox"/> Inspector's comments |
| <input type="checkbox"/> Basis for change of Category or Priority |   |
-

LICENSE NO: 08-01738-03

DOCKET NO. (s) 030-06895

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ATTACHED

- Appendix A
- Appendix B
- Appendix C
- Memo

INSPECTION REPORT NO. 86-01

DEPT. OF THE ARMY  
WALTER REED ARMY/MEDICAL CENTER  
WASHINGTON, D.C. 20012

LICENSEE CONTACT: MAJOR CONNOCK

Telephone No 202-576-1100

LICENSE NO: 08-01738-03

CATEGORY E PRIORITY: 3

CATEGORY \_\_\_\_\_ PRIORITY: \_\_\_\_\_

CATEGORY \_\_\_\_\_ PRIORITY: \_\_\_\_\_

INSPECTION DATE (s): 6/23; 6/24 + 6/25/86

- TYPE OF INSPECTION:
- SPECIAL  ANNOUNCED
  - ROUTINE  UNANNOUNCED
  - DAYSHIFT
  - OTHER

SUMMARY OF FINDINGS AND ACTION

- NO NONCOMPLIANCE, CLEAR 591 ISSUED
- NO NONCOMPLIANCE, LETTER
- NONCOMPLIANCE, APPENDIX A

- ACTION ON PREVIOUS NONCOMPLIANCE, APPENDIX B
- NONCOMPLIANCE, 591 ISSUED
- SUPPLEMENTAL INFO, APPENDIX C

RECOMMENDATIONS  
SEE BASIS IN APPENDIX C

CHANGE CATEGORY TO: \_\_\_\_\_

NEXT INSPECTION DATE: 06/89

CHANGE PRIORITY TO: \_\_\_\_\_

PERSONS CONTACTED

Dr. B. Bass, RSO  
MAJ. CONNOCK, HPO

INSPECTOR: \_\_\_\_\_

APPROVED: \_\_\_\_\_

X/23

INSPECTION PLAN AND REPORT NUMBER \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

Plan Approved: \_\_\_\_\_ Date: \_\_\_\_\_

Licensee: \_\_\_\_\_ License No. \_\_\_\_\_

Inspection Items	Scheduled for Inspection	Post Inspection Status	Module No.
Management Meeting - Entrance and Exit Interviews (Required)			30703B
Program Requirements, MC 2850 (Required)			77710B
Followup on Noncompliance and Deviations			92702B
Independent Inspection Effort (Required)			92706B
Transportation			86740B

INSPECTION REPORT NUMBER 86-01

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77710B - Irradiator

AREAS INSPECTED AND FINDINGS

Licensee: WALTER REED ARMY MEDICAL CENTER License No: 08-01738-03 Amendment No: \_\_\_\_\_

INSPECTION ITEMS	CRITERIA	FINDING
------------------	----------	---------

1. Organization

Lic Cond \_\_\_\_\_

C

- Management organization?
- Radiation protection organization?
- Scope of program?
- NOTES & REMARKS:

Dr. BASS IS RESPONSIBLE TO ASSURE THAT USERS HAVE HAD TRAINING.

2. Licensee Internal Audits

Lic Cond \_\_\_\_\_

NA

- Scope and frequency?
- Management controls?
- NOTES & REMARKS:

3. Training and Instructions to Employees

Lic Cond \_\_\_\_\_

C

- Training program, scope and frequency, retraining?
- Required tests administered; scores satisfactory?
- Instructions to workers?
- NOTES & REMARKS:

19.12 - ALL PERSONNEL HAVE HAD COURSE GIVEN BY HP OFFICE OR ARE INSTRUCTED BY Dr. BASS

4. Radiation Protection Procedures

Lic Cond \_\_\_\_\_

C

- Operating & emergency procedures implemented?
- Security?
- NOTES & REMARKS:

20.207

ROOM HOUSING TWO IRRADIATORS IS MAINTAINED LOCKED

AREAS INSPECTED AND FINDINGS

Licensee: \_\_\_\_\_ License No: \_\_\_\_\_ Amendment No: \_\_\_\_\_

INSPECTION ITEM	CRITERIA	FINDING
5. <u>Materials, Facilities and Instruments</u>		<u>C</u>
Authorized uses and quantities?	Lic Cond _____	
Restricted areas, posting requirements?	20.203	
Survey instruments & dosimeters; operable, properly calibrated?	Lic Cond _____	
Independent area radiation monitor?	1) AECL GAMMACELL 220	
Survey meter used on entering HRA?	Co-60 8,000 Ci	
NOTES & REMARKS:	2) AECL GAMMACELL 40 Cs-137 3,700 Ci	
6. <u>Receipt and Transfer of Materials</u>		<u>NA</u>
Procedures implemented, adequate?	20.205, 71.51	
Transfer of byproduct material?	30.41	
Control of source material, SNM?	40.51, 40.64, 70.42, 70.51, 70.53, 70.54	
Records of receipt, transfer, storage, survey and monitoring?	30.51	
NOTES & REMARKS: - SOURCES HAVE NOT BEEN MOVED		
7. <u>Control of High Radiation Area</u>		<u>C</u>
Interlocks, tests, entry control?	20.203(c)(6)	
Action if entry control device fails?	- HIGHEST READING (@ 18 INCHES) MACHINES OFF 1 mR/hr	
Device to prevent source exposure with individual in chamber?		
Level control for liquid shield?	MACHINES ON 4.5 mR/hr	
Source exposure procedure?		
Control of portals (continuous irradiator)?		
NOTES & REMARKS:		

AREAS INSPECTED AND FINDINGS

Licensee: \_\_\_\_\_ License No: \_\_\_\_\_ Amendment No: \_\_\_\_\_

INSPECTION ITEM	CRITERIA	FINDING
<u>8. Transportation</u>		
Management controls, audits?		<u>NA</u>
Selection of packaging?	49 CFR 173.393-5, 10 CFR 71	
Preparation of packages for shipment?	49 CFR 172, 173	
Filling, loading, closing, liquids?	49 CFR 172, 300	
Markings & labelling?	49 CFR 172.403, 402	
Monitoring?	49 CFR 173.393	
Shipping papers, loading & placarding of vehicles?	49 CFR 172.200	
Reports of Incidents?		
Examination of packages?		
NOTES & REMARKS:		
<u>9. Personnel Protection- External</u>		
Personnel monitoring control; minimize exposures, control of accumulated dose?	20.101, 20.102, 20.202	<u>C</u>
Surveys conducted, adequate?	20.201	
Records of monitoring, surveys, disposals?	20.401, Lic Cond _____	
Levels in unrestricted areas?	20.1, 20.105	
NOTES & REMARKS:		
- FILM BADGES DISTRIBUTED TO USERS		
<u>10. Personnel Protection - Internal</u>		
Airborne concentrations in restricted areas?	20.103	<u>C</u>
Exposure of minors?	20.104	
Posting of airborne radioactivity areas?	20.203	
Survey, monitoring, bioassay requirements; records?	20.201, 20.401	
Leak tests of sealed sources?	Lic Cond _____	
NOTES & REMARKS:		
- LEAK TESTS PERFORMED TIMELY, NO CONTAMINATION DETECTED		

## AREAS INSPECTED AND FINDINGS

Licensee: \_\_\_\_\_ License No: \_\_\_\_\_ Amendment No: \_\_\_\_\_

INSPECTION ITEM	CRITERIA	FINDING
<u>11. Effluent Control, Waste Disposal</u>		
Release of effluents?	20.106	<u>NA</u>
Waste disposal, proper packaging for shipment?	20.301, 20.303, 20.304, 20.305	
Procedures, records?	20.401, Lic Cond _____	
NOTES & REMARKS:		
<u>12. Shipping, Shipping Incidents</u>		
Procedures for pickup, receipt, monitoring of packages?	20.205(b) & (c)	<u>NA</u>
Incidents, reports, corrective actions?	49 CFR 170-189	
NOTES & REMARKS:		
<del>NA</del> SOURCES HAVE NOT BEEN MOVED		
<u>13. Notifications and Reports</u>		
To individuals?	19.13	<u>C</u>
Overexposures, excessive levels & concentrations, incidents?	20.403, 20.405	
Personnel exposures and monitoring, termination reports?	20.407, 20.408	
Theft or loss of licensed material?	20.402	
NOTES & REMARKS:		
- NO REPORTABLE INCIDENTS HAVE OCCURRED		
<u>14. Posting of Notices</u>		
Part 20, license & documents, procedures, notice of violations?	19.11(a)	<u>C</u>
NRC-3?	19.11(c)	
NOTES & REMARKS:		
- ALL <del>NA</del> REQUIRED POSTINGS ARE MADE		

AREAS INSPECTED AND FINDINGS

Licensee: \_\_\_\_\_ License No: \_\_\_\_\_ Amendment No: \_\_\_\_\_

INSPECTION ITEM	CRITERIA	FINDING
<p>15. <u>Environmental Monitoring Program</u></p> <p>Implementation of program, scope and frequency as required?</p> <p>Records maintained, reviewed by management?</p> <p>NOTES &amp; REMARKS:</p>	Lic Cond _____	<u>NA</u>
<p>16. <u>Emergency Preparedness</u></p> <p>Procedures available for incidents and accidents?</p> <p>Training for personnel; coordination with supporting groups and agencies?</p> <p>NOTES &amp; REMARKS:</p>	Lic Cond _____	<u>C</u> <i>- EMERGENCY PROCEDURES POSTED ON WALL - ADEQUATE</i>
<p>17. <u>Other License Conditions</u></p> <p>NOTES &amp; REMARKS:</p>		
<p>18. <u>Confirmatory Measurements</u></p> <p>Licensee's surveys verified on sampling basis? 20.105, 20.201</p> <p>Analysis of pool water sample?</p> <p>NOTES &amp; REMARKS:</p>		
<p>NRC Instrument: _____ Calibration Due Date: _____</p>		
<p>19. <u>Independent Inspection Effort</u></p> <p>NOTES &amp; REMARKS:</p>		

INSPECTION REPORT NUMBER \_\_\_\_\_

Page \_\_\_\_\_ of \_\_\_\_\_

APPENDIX A - DOCUMENTATION OF NONCOMPLIANCE

Licensee: \_\_\_\_\_

License No: \_\_\_\_\_

Reference	Basis for noncompliance
Report item _____ 10 CFR _____ Lic Cond _____ Type n/c _____	<u>CLEAR</u>
Report item _____ 10 CFR _____ Lic Cond _____ Type n/c _____	
Report item _____ 10 CFR _____ Lic Cond _____ Type n/c _____	
Report item _____ 10 CFR _____ Lic Cond _____ Type n/c _____	
Report item _____ 10 CFR _____ Lic Cond _____ Type n/c _____	
Report item _____ 10 CFR _____ Lic Cond _____ Type n/c _____	

INSPECTION REPORT NUMBER \_\_\_\_\_

Page \_\_\_\_\_ of \_\_\_\_\_

APPENDIX B - LICENSEE ACTION ON PREVIOUS INSPECTION FINDINGS

Licensee: \_\_\_\_\_

License No: \_\_\_\_\_

Identification and summary of action taken	Status
--	--------

Report No: \_\_\_\_\_ Type n/c: \_\_\_\_\_ Describe: \_\_\_\_\_

Action taken: \_\_\_\_\_  
*LAST INSP. CLEAR 84-01*  
\_\_\_\_\_ OPEN  
\_\_\_\_\_ CLOSED

Report No: \_\_\_\_\_ Type n/c: \_\_\_\_\_ Describe: \_\_\_\_\_

Action taken: \_\_\_\_\_  
\_\_\_\_\_ OPEN  
\_\_\_\_\_ CLOSED

Report No: \_\_\_\_\_ Type n/c: \_\_\_\_\_ Describe: \_\_\_\_\_

Action taken: \_\_\_\_\_  
\_\_\_\_\_ OPEN  
\_\_\_\_\_ CLOSED

Report No: \_\_\_\_\_ Type n/c: \_\_\_\_\_ Describe: \_\_\_\_\_

Action taken: \_\_\_\_\_  
\_\_\_\_\_ OPEN  
\_\_\_\_\_ CLOSED

Report No: \_\_\_\_\_ Type n/c: \_\_\_\_\_ Describe: \_\_\_\_\_

Action taken: \_\_\_\_\_  
\_\_\_\_\_ OPEN  
\_\_\_\_\_ CLOSED

Report No: \_\_\_\_\_ Type n/c: \_\_\_\_\_ Describe: \_\_\_\_\_

Action taken: \_\_\_\_\_  
\_\_\_\_\_ OPEN  
\_\_\_\_\_ CLOSED

APPENDIX C - SUPPLEMENTARY INFORMATION

Licensee: \_\_\_\_\_ License No: \_\_\_\_\_

- 
- |   |   |
|---|---|
| <input type="checkbox"/> Uncorrected/repeated noncompliance       | <input type="checkbox"/> Unresolved items     |
| <input type="checkbox"/> Unusual occurrence, conditions, etc      | <input type="checkbox"/> Inspector's comments |
| <input type="checkbox"/> Basis for change of Category or Priority |   |
-

APPENDIX E

NOTE: All areas indicated in field notes are not required to be addressed during each inspection

INDUSTRIAL/ACADEMIC/RESEARCH INSPECTION FIELD NOTES  
Region I

Inspection Report No. 030-06895/95-001

License No. 08-01788-03

Licensee (Name & Address):  
Dept: of the Army  
Walter Reed Army Medical Ctr.  
(WRAMC)  
Washington, D.C. 20307-5001

Docket No. 030-06895

Licensee Contact David Burton, Chief  
RMC Branch (Rad. mat'l Control)  
Last Amendment No. 23

Telephone No. 301-427-5161

Date of Amendment 6/23/94

Priority: 3  
Program Code 3510

Date of Last Inspection 2/6/90  
Date of This Inspection 5/2/95

Type of Inspection:       Announced       Unannounced  
                                  Routine             Special  
                                  Initial                 Reinspection

Next Inspection Date 05/2000       Normal     Reduced     Extended

Summary of Findings and Action:

- No violations cited, Clear 591 issued
- Violation(s), 591 issued
- Violation(s), Regional letter issued
- Followup on Previous Violations

Were non-cited violations identified during this inspection?       Y  N

Was proprietary information reviewed by or received by the inspector?       Y  N

Inspector: A. Kirkwood  
(Signature)

Date 6-18/95

Approved: [Signature]  
(Signature)

Date 6-9-95

1. INSPECTION HISTORY

( ) N/A - Initial inspection

- A. Violations were identified during any of the last two inspections or two years, whichever is longer ( ) Y (X) N \*
- B. Response letter(s) or 591(s) dated \_\_\_\_\_
- C. Open violations from previous inspections:

<u>Requirement</u>	<u>Violation</u>	<u>Corrective Action Taken (Y/N)</u>	<u>Status Open/Closed</u>

- D. Explain any previous violation(s) not corrected or repeated ( ) N/A

\* No violations during last two inspections of this license.

2. ORGANIZATION AND SCOPE OF PROGRAM

- A. Organizational Structure \* Col Johnson, Dir, Safety, RSO
- + Mark Shields, Graduate Bone Marrow Processing Lab. (Blood Transf.)
- + Jeffrey Bisch, Med. Tech. \* David Burton, Chief RMC Branch
- + Adrienne Nelson, Principle Uses, Safety Hypo's
- + Dr. Schneider, Entomology

- + Individuals contacted during inspection
- \* Individuals present at exit meeting

- 1. Meets license requirements [L/C] (X) Y ( ) N
  - 2. Multiple authorized locations of use and/or laboratories (X) Y ( ) N
- If yes, may use ATTACHMENT A as a guide for location(s) or lab(s) inspected and note lab numbers where violations are found. ( ) N/A

- 3. Briefly describe scope of activities, including types and quantities of use involving byproduct material, frequency of use, staff size, etc.

Three irradiators - all self shielded. Item 6A on license should read Cobalt 60 instead of Cesium 137. Previous license correct. Item 6-B. not used five years. Item 6-C. is a blood irradiator used daily by med Techs. Cobalt used mainly by Entomology + Immunology for two weeks out of month.

- B. Radiation Safety Committee required [L/C] ( ) Y ( ) N (X) N/A
- 1. RSC fulfills license requirements [L/C] ( ) Y ( ) N
- 2. Records maintained [L/C] ( ) Y ( ) N

C. Radiation Safety Officer

- 1. Authorized on license [L/C]
- 2. Fulfills duties as RSO

() Y ( ) N  
 () Y ( ) N

D. Use by authorized individuals [L/C]

() Y ( ) N

Remarks: Checked list of users for blood irradiation and Co-60 irradiation use logs. No unauthorized use observed.

3. TRAINING, RETRAINING, AND INSTRUCTIONS TO WORKERS

- A. Instructions to workers/students per [10 CFR 19.12]
- B. Training program required [L/C]

() Y ( ) N  
 () Y ( ) N

1. If so, briefly describe training program:

- General Safety  
- Site specific

- 2. Training program implemented
- 3. Periodic training program required
- 4. Periodic training program implemented
- 5. Records maintained

() Y ( ) N  
 ( ) Y ( ) N  
 ( ) Y ( ) N  
 () Y ( ) N

C. Individuals understanding of procedures and Regulations is adequate

() Y ( ) N

- 1. Current operating procedures
- 2. Emergency procedures
- 3. Use of survey instrumentation

() Y ( ) N  
 () Y ( ) N  
 () Y ( ) N

D. Revised Part 20

Workers cognizant of requirements for:

- 1. Radiation Safety Program [20.1101]
- 2. Annual dose limits [20.1301, 1302]
- 3. New forms 4 and 5
- 4. 10% monitoring threshold [20.1502]
- 5. Dose limits to embryo/fetus and declared pregnant worker [20.1208]
- 6. Grave Danger Posting [20.1902]
- 7. Procedures for opening packages [20.1906]
- 8. Sewer disposal limits [20.2003]

() Y ( ) N  
 () Y ( ) N  
 () N/A ( ) Y ( ) N  
 () Y ( ) N  
 () N/A ( ) Y ( ) N  
 () N/A ( ) Y ( ) N  
 () N/A ( ) Y ( ) N

NOTE: Deficiencies in this area, while not always a violation, should be brought to the attention of licensee management at the exit meeting and in the cover letter transmitting the inspection report or NOV.

Remarks:

4. INTERNAL AUDITS, REVIEWS OR INSPECTIONS

- A. Audits are required [L/C]  Y  N
- B. Audits or inspections are conducted  Y  N
- (1) Audits conducted by HP Staff
- (2) Frequency quarterly
- C. Content and implementation of the radiation protection program reviewed annually by the licensee [20.1101(c)]  Y  N
- D. Records maintained [20.2102]  Y  N

5. FACILITIES

- A. Facilities as described in license application [L/C]  Y  N
- B. Describe any Self-contained dry-source-storage irradiators [Part 36] and/or survey instrument calibrators (model, radionuclide, activity, use, etc.)  N/A
- 1) J. L. Shepherd Model 143, S/N 2044 (Cs-137, 2944 Ci) (1985) located in Hospital Blood Bank, Rm 4 E01.
- 2) Gammacell 220 (Co-60, 11,800 Ci on 9/67) WRAIR Bldg, Rm B-099
- 3) Gammacell 40 (Cs-137, 3,600 Ci on 4/72) NOT used since 1987.
1. Maintenance of safety-related components performed by authorized persons [L/C]  Y  N
2. Access to keys and/or material controlled [20.1801, 1802, L/C]  Y  N
3. Access to high/very high radiation areas controlled [20.1601, 1602, L/C]  Y  N/A
4. Adequate protection of shield integrity, fire protection [L/C]  Y  N \*

Remarks:

Rm. B-099 in WRAIR Bldg. shared w/ maintenance. Room seems cluttered. Check during next inspection for fire protection (combustibles). License states low risk area because lack of combustibles.

6. MATERIALS

- A. Isotope, chemical form, quantity and use as authorized [L/C]  Y  N \*
- B. Licensed materials secured to prevent unauthorized removal or access [20.1801, 1802]  Y  N
- C. Leak tests and Inventories [L/C]
1. Performed as required  N/A  Y  N
2. Adequate analysis methodology and sensitivity  N/A  Y  N
3. Records maintained [L/C]  Y  N

Remarks:

License incorrectly states on L.C. Co-60. Csium-137, should be Co-60 as stated on previous (Amendment No. 22) license. Licensee stated they would send a letter requesting change.

7. RADIATION SURVEYS

A. Instruments and equipment:

- 1. Appropriate operable survey instrumentation possessed and readily accessible [L/C]  Y ( ) N
- 2. Calibrated as required [20.1501, L/C]  Y ( ) N
- 3. Calibration records maintained [20.2103(a)] ( ) Y ( )  N/I

B. Briefly describe area survey requirements [20.1501(a), L/C]:

Bldg 40 (WARRA):

- Area monitor - Ludlum M375, GAM, S/N 113810 (model 375/2) Calib 5/28/94 by Ludlum.
- Ludlum model 28 Ratemeter, Calib 5/6/94

C. Performed as required [20.1501(a), L/C]  Y ( ) N

- 1. Contamination found ( ) Y ( )  N/A
- 2. Corrective action taken and documented ( ) Y ( ) N

D. Records maintained [20.2103, L/C] ( ) Y ( )  N/I

E. Protection of members of the public

- 1. Licensee made adequate surveys to demonstrate either (1) that the TEDE to the individual likely to receive the highest dose does not exceed 100 mrem in a year, or (2) that if an individual were continuously present in an unrestricted area, the external dose would not exceed 2 mrem in any hour and 50 mrem in a year [20.1301(a)(1), 1302(b)] ( ) Y ( )  N/I
- 2. Unrestricted area radiation levels do not exceed 2 mrem in any one hour [20.1301(a)(2)] ( ) Y  N - don't
- 3. Records maintained [20.2103, 2107] ( ) Y ( )  N/I

Remarks: See Item 12

8. RADIOACTIVE WASTE

N/A

A. Disposal

N/A

1. Decay-in-storage  N/A

- a. Procedures approved [20.2001(a)(2), L/C] ( ) Y ( ) N
- b. In accordance with [L/C] ( ) Y ( ) N
- c. Labels removed or defaced [20.1904(b)] ( ) Y ( ) N

2. Special procedures performed as required [L/C] ( ) Y ( ) N

3. Liquid scintillation (LS) media and animal carcasses per [20.2005] ( ) N/A ( ) Y ( ) N

4. Improper/unauthorized disposals [20.2001] ( ) Y ( ) N

5. Records maintained [20.2103(a), 2108, L/C] ( ) Y ( ) N

B. Effluents

N/A

1. Release into sanitary sewer [20.2003] ( ) N/A ( ) Y ( ) N

- a. Material is readily soluble or readily dispersible [20.2003(a)(1)] ( ) Y ( ) N
- b. Monthly average release concentrations do not exceed Appendix B values [20.2003] ( ) Y ( ) N
- c. No more than 5 Ci of H-3, 1 Ci of C-14 and 1 Ci of all other radionuclides combined released in a year [20.2003] ( ) Y ( ) N
- d. Procedures to ensure representative sampling and analysis properly implemented [20.1501(a)(2), L/C] ( ) Y ( ) N

2. Release to septic tanks [20.2003] ( ) N/A ( ) Y ( ) N

- a. Within unrestricted limits [App B, Table 2] ( ) Y ( ) N

3. Waste incinerated ( ) N/A ( ) Y ( ) N

- a. License authorizes [20.2004(a)(3)] ( ) Y ( ) N
- b. Licensee directly monitors exhaust ( ) Y ( ) N
- c. Airborne releases evaluated and controlled [20.1501, 1701] ( ) Y ( ) N

4. Control of effluents and ashes [20.1201, 1301, 1501, 2001, L/C] [See also IP 87102, RG 8.37] ( ) Y ( ) N

a. Compliance with air emissions requirements in Part 20:

Licensee has demonstrated compliance with air emission requirements in 10 CFR Part 20 ( ) Y ( ) N

Basis for compliance determination (circle one or more; provide basis below)

- \_\_\_(1) Measured concentrations of radionuclides in air effluents are below Appendix B, Table 2 concentrations (and external dose < 50 mrem/yr)
- \_\_\_(2) Bounding calculations show that air effluents could not exceed Appendix B, Table 2 concentrations (and external dose < 50 mrem/yr)
- \_\_\_(3) Dose modeling shows that dose equivalent to the individual likely to receive the highest dose does not exceed 10 mrem/yr
- \_\_\_(4) Licensee does not possess sufficient radioactive material to exceed Part 20 requirements

Basis for Determination: \_\_\_\_\_

\_\_\_\_\_

b. Description of effluent monitoring program

- 1. Monitoring system hardware equipment adequate ( ) Y ( ) N
- 2. Equipment calibrated as appropriate ( ) Y ( ) N
- 3. Air samples/sampling technique (charcoal, HEPA, etc.) analyzed with appropriate equipment ( ) Y ( ) N

Remarks:

c. Waste Management (X) N/A

- 1. Waste compacted [L/C] ( ) Y ( ) N
- 2. Storage area(s) ( ) N/A
  - a. Protection from elements and fire [L/C] ( ) Y ( ) N
  - b. Control of waste maintained [20.1801] ( ) Y ( ) N
  - c. Containers properly labeled and area properly posted [20.1902, 1904] ( ) Y ( ) N
  - d. Package integrity maintained [L/C] ( ) Y ( ) N
- 3. Packaging, Control and Tracking [App. F.III] [20.2006(d)]:

Note: The licensee's waste is likely to be Class A.

- a. Not packaged for disposal in cardboard or fiberboard boxes [61.56(a)] ( ) Y ( ) N
- b. Liquid wastes solidified, i.e., less than 1% freestanding liquid, and void spaces minimized [61.56(a), (b)] ( ) Y ( ) N
- c. Does not generate harmful vapors [61.56] ( ) Y ( ) N
- d. Structurally stable (will maintain its physical dimensions and form under expected disposal conditions) [61.56(b)] ( ) Y ( ) N
- e. Packages properly labeled [App. F.III.A.2] ( ) Y ( ) N
- f. Licensee conducts a QC program to ensure compliance with [61.55, 56] and includes management evaluation of audits [App. F.III.A.3] ( ) Y ( ) N
- g. Shipments not acknowledged within 20 days after transfer are investigated and reported [App. F.III.A.8] ( ) N/A ( ) Y ( ) N
- 4. Transfers to land disposal facilities (X) N/A
  - a. Transferred to person specifically licensed to receive waste [30.41, 20.2001(b)] ( ) Y ( ) N
  - b. Each shipment accompanied by a manifest prepared as specified in Section I of Appendix F [20:2006(b), App. F.III.A.4] ( ) Y ( ) N
  - c. Manifests certified as specified in Section II of Appendix F [20.2006(c)] ( ) Y ( ) N

D. Records of surveys and material accountability are maintained [20.2103, 2108]

( ) Y ( ) N

Remarks:

9. RECEIPT AND TRANSFER OF RADIOACTIVE MATERIAL

A. Describe how packages are received and by whom:

N/A

- B. Written package opening procedures established and followed [20.1906(e)] ( ) Y ( ) N
- C. All incoming packages with DOT labels wiped, unless exempted (gases and special form) [20.1906(b)(1)] ( ) Y ( ) N
- D. Incoming packages surveyed per [20.1906(b)(2)] ( ) Y ( ) N
- E. Monitoring in (C) and (D) above, performed within time specified [20.1906(c)] ( ) Y ( ) N
- F. Transfer(s) between licensees performed per [30.41] ( ) Y ( ) N
- G. All sources surveyed before shipment and transfer [20.1501(a), 49 CFR 173.475(i), L/C] ( ) Y ( ) N
- H. Records of surveys and receipt/transfer maintained [20.2103(a), 30.51] ( ) Y ( ) N
- I. Transfers within licensee's authorized users or locations performed as required [L/C] ( ) N/A ( ) Y ( ) N
- J. Arrangements made for packages containing quantities of radioactive material in excess of Type A quantity [20.1906(a)] ( ) Y ( ) N
- K. Package receipt/distribution activities evaluated for compliance with 20.1301 [20.1302] ( ) N/A ( ) Y ( ) N

Remarks:

10. TRANSPORTATION (10 CFR 71.5(a) and 49 CFR 170-189)

N/A

A. Licensee shipments are:

- ( ) delivered to common carriers
- ( ) transported in licensee's own private vehicle
- ( ) both
- ( ) no shipments since last inspection

- B. HAZMAT training [172.700-704] ( ) Y ( ) N  
 C. Packages ( ) N/A
1. Authorized packages used [173.415, 416(b)] ( ) Y ( ) N
  2. Performance Test records on file ( ) N/A
    - a. Special Form Sources [173.476(a)] ( ) Y ( ) N
    - b. DOT-7A packages [173.415(a)] ( ) Y ( ) N
  3. COCs on file with NRC for Type B [71.12(c)(1)] ( ) Y ( ) N
  4. Two labels (White-I, Yellow-II, Yellow-III) with TI, Nuclide, Activity, and Hazard Class [172.403, 173.441] ( ) Y ( ) N
  5. Properly marked (Shipping Name, UN Number, Package Type, RQ, "This End Up" (liquids), Name and Address of consignee) [172.301,306,310,312,324] ( ) Y ( ) N
  6. Closed and sealed during transport [173.475(f)] ( ) Y ( ) N
- D. Shipping Papers ( ) N/A
1. Prepared and used [172.200(a)] ( ) Y ( ) N
  2. Proper {Shipping name, Hazard Class, UN Number, Quantity, Package Type, Nuclide, RQ, Radioactive Material, Physical and chemical form, Activity, Category of label, TI, Shipper's Name, Certification and Signature, Emergency Response Phone Number, "Limited Quantity" (if applicable), "Cargo Aircraft Only" (if applicable)} [172.200-204] ( ) Y ( ) N
  3. Readily accessible during transport [177.718(e)] ( ) Y ( ) N
- E. Vehicles ( ) N/A
1. Placarded [172.504] ( ) Y ( ) N
  2. Cargo blocked and braced [177.842(d)] ( ) Y ( ) N
  3. Proper overpacks (shipping name, UN Number, labeled, statement indicating that inner package complies with specification packaging) [173.25] ( ) Y ( ) N
- F. Any incidents reported to DOT [171.15, 16] ( ) Y ( ) N

Remarks:

11. PERSONNEL RADIATION PROTECTION

- A. Licensee performed exposure evaluation [20.1501] (✓) Y ( ) N  
 B. Licensee incorporated ALARA considerations in the Radiation Protection Program [20.1101(b)] (✓) Y ( ) N

C. External Dosimetry ( ) N/A

- 1. Licensee monitors workers [20.1502(a), L/C] ( ) Y (  ) N
- 2. External exposures account for contributions from airborne activity [20.1203] (  ) N/A ( ) Y ( ) N
- 3. Supplier \_\_\_\_\_ Frequency \_\_\_\_\_ ( ) Y ( ) N N/A
- 4. Supplier is NVLAP-approved [20.1501(c)] ( ) Y ( ) N
- 5. Dosimeters exchanged at required frequency [L/C] ( ) Y ( ) N

D. Internal Dosimetry (  ) N/A

- 1. Licensee monitors workers [20.1502(b), L/C] ( ) Y ( ) N
- 2. Briefly describe licensee's program for monitoring and controlling internal exposures [20.1701, 1702, L/C]:
- 3. Air sampling performed ( ) Y ( ) N
- 4. Monitoring/controlling program implemented ( ) Y ( ) N
- 5. Respiratory protection equipment [20.1703, L/C] ( ) Y ( ) N

E. Reports (  ) N/A

- 1. Reviewed by \_\_\_\_\_ Frequency \_\_\_\_\_
- 2. Inspector reviewed personnel monitoring records for period \_\_\_\_\_ to \_\_\_\_\_
- 3. Prior dose determined for individuals likely to receive doses [20.2104] ( ) Y ( ) N
- 4. Maximum exposures TEDE \_\_\_\_\_ Other \_\_\_\_\_
- 5. Maximum CDEs \_\_\_\_\_ Organs \_\_\_\_\_
- 6. Maximum CEDE \_\_\_\_\_
- 7. Licensee sums internal and external [20.1202] ( ) Y ( ) N
- 8. TEDEs and TODEs within limits [20.1201] ( ) Y ( ) N
- 9. NRC Forms or equivalent [20.2104(d), 2106(c)]
  - a. NRC-4 ( ) Y ( ) N Complete: ( ) Y ( ) N
  - b. NRC-5 ( ) Y ( ) N Complete: ( ) Y ( ) N
- 10. Worker declared her pregnancy in writing during inspection period (review records) ( ) N/A ( ) Y ( ) N  
If yes, licensee in compliance with [20.1208] ( ) Y ( ) N  
and records maintained [20.2106(e)] ( ) Y ( ) N

F. Who performed PSEs at this facility (number of people involved and doses received) [20.1206, 2104, 2105, 2204] (  ) N/A

G. Records of exposures, surveys, monitoring, and evaluations maintained [20.2102, 2103, 2106, L/C] (  ) Y ( ) N

Remarks: licensee stated they did dose survey evaluation of Blood Bank + WRAIR irradiators. Suspended Blood Bank personnel dosimetry Jan-95 and WRAIR in Apr 95. Documents not available this inspection. Person responsible, blackout. Request to see during next inspection. Area monitors are in place in both locations. Inspector measurements consistent with this action.

12. NRC INDEPENDENT MEASUREMENTS

A. Survey instrument      Serial No.      Last calibration  
Ion-10335      10335      3/30/95

- B. Inspector's measurements were compared to licensee's ( ) Y (X) N  
C. Describe the type, location, and results of measurements:

RHEOT: Computed down @ top 0.5 mklhr  
" up all areas < 0.1 " "

Rm B-049 All areas < 0.1 mklhr. w/ cobalt source in use.

13. NOTIFICATION AND REPORTS

( ) N/A

- A. Licensee in compliance with [19.13, 30.50] (reports to individuals, public and occupational, monitored to show compliance with Part 20) (X) N/A ( ) Y ( ) N  
B. Licensee in compliance with [20.2201, 30.50] (theft or loss) (X) None ( ) Y ( ) N  
C. Licensee in compliance with [20.2202, 30.50] (incidents) (X) None ( ) Y ( ) N  
D. Licensee in compliance with [20.2203, 30.50] (overexposures and high radiation levels) (X) None ( ) Y ( ) N  
E. Licensee aware of NRC Ops Center phone number (X) Y ( ) N

14. POSTING AND LABELING

- A. NRC-3 "Notice to Workers" is posted [19.11] (X) Y ( ) N  
B. Parts 19, 20, 21, Section 206 of Energy Reorganization Act, procedures adopted pursuant to Part 21, and license documents are posted or a notice indicating where documents can be examined is posted [19.11, 21.6] (X) Y ( ) N  
C. Other posting and labeling per [20.1902, 1904] and the licensee is not exempted by [20.1903, 1905] (X) Y ( ) N

Remarks:

15. RECORDKEEPING FOR DECOMMISSIONING

(X) N/A

- A. Records of information important to the safe and effective decommissioning of the facility maintained in an independent and identifiable location until license termination [30.35(g)] ( ) Y ( ) N  
B. Records include all information outlined in [30.35(g)] ( ) Y ( ) N

Remarks:

No leakage of sealed sources

16. BULLETINS AND INFORMATION NOTICES

- A. Bulletins, Information Notices, NMSS Newsletters, etc., received by the Licensee
- B. Licensee took appropriate action in response to Bulletins, Generic Letters, etc.

() Y ( ) N  
( ) Y (  ) N/A

Remarks:

17. SPECIAL LICENSE CONDITIONS OR ISSUES

() N/A

- A. Special license conditions or issues to be reviewed:
- B. Evaluation:

18. CONTINUATION OF REPORT ITEMS

() N/A

19. VIOLATIONS, NCVs, AND OTHER ISSUES

() N/A

Note: Briefly state (1) the requirement and (2) how and when the licensee violated the requirement. For non-cited violations, indicate why the violation was not cited.

*Clear 591*

20. DEBRIEF WITH LICENSING STAFF

Inspection findings discussed with licensing staff () N/A ( ) Y ( ) N

Items discussed:

21. EPA REFERRAL FORM

EPA referral form for air effluents sent to appropriate EPA regional office per IP 87102

( ) Y (  ) N/A

22. PERFORMANCE EVALUATION FACTORS

Licensee (name & location)

ARM - WRAMC  
Wash, D.C.

Inspector

A. Kirkwood

Inspection Date

5/2/95

- A. Lack of senior management involvement with the radiation safety program and/or Radiation Safety Officer (RSO) oversight ( ) Y (  ) N
- B. RSO too busy with other assignments ( ) Y (  ) N
- C. Insufficient staffing ( ) Y (  ) N
- D. Radiation Safety Committee fails to meet or functions inadequately (  ) N/A ( ) Y ( ) N
- E. Inadequate consulting services or inadequate audits (  ) N/A ( ) Y ( ) N

Remarks (consider above assessment and/or other pertinent PEFs):

*See below*

Regional follow-up on above PEFs citations:

END

*Recommend extension of inspection to 5 years interval (5/00). Licensee program efficiently run, stable staff and low risk self-shielded irradiators.*

Walter J. Pascale, Chief  
Industrial Applications Section

ATTACHMENT A  
LABORATORY INSPECTION FIELD NOTES

(N/A)

1. Date \_\_\_\_\_ Authorized User(s) \_\_\_\_\_
2. Location(s) Building \_\_\_\_\_ Room(s) \_\_\_\_\_
3. Person(s) Contacted \_\_\_\_\_
4. Describe scope of lab use (Nuclides, form, frequency, purpose, etc): \_\_\_\_\_

5. Training
- A. Frequency: \_\_\_\_\_ Conducted by: \_\_\_\_\_ ( ) Y ( ) N
- B. Individuals interviewed understand safety practices ( ) Y ( ) N
- Remarks:

6. Surveys
- A. Types of surveys performed (daily, weekly, monthly, etc.)
- B. Instrumentation properly calibrated and used ( ) Y ( ) N
- C. Efficiency of counting system determined ( ) Y ( ) N
- D. Hood airflow adequate and checked as required ( ) N/A ( ) Y ( ) N
- E. Records maintained: trigger levels established, area diagram, instrument used, individual performing survey, results in proper units, decontamination performed as necessary, etc.) ( ) Y ( ) N
- F. Inspector surveyed ( ) Y ( ) N
- Results satisfactory ( ) N/A ( ) Y ( ) N
- Remarks:

7. Receipt and Transfer
- A. Incoming packages properly surveyed ( ) Y ( ) N
- B. Interlaboratory transfers performed as specified in the license ( ) N/A ( ) Y ( ) N
- C. Records maintained ( ) Y ( ) N
- Remarks:

8. Personnel Dosimetry
- A. Appropriate dosimetry assigned and worn ( ) N/A ( ) Y ( ) N
- B. Results available to lab personnel ( ) Y ( ) N
- C. Bioassays performed ( ) N/A ( ) Y ( ) N
- Remarks:

9. Handling Waste
- A. Procedures followed ( ) Y ( ) N
- B. Proper storage (area, containers, labeling, etc.) ( ) Y ( ) N
- C. Liquid/solid waste disposal ( ) Y ( ) N
- D. Incineration ( ) N/A ( ) Y ( ) N
- E. Compaction ( ) N/A ( ) Y ( ) N
- F. Sewer discharge ( ) N/A ( ) Y ( ) N
- G. Records maintained ( ) Y ( ) N
- Remarks:

10. Inventory conducted ( ) N/A ( ) Y ( ) N
- Records Maintained ( ) Y ( ) N
- Remarks:

11. Storage and use of RAM
- A. Adequate method to prevent unauthorized access ( ) Y ( ) N
- B. Condition of areas acceptable ( ) Y ( ) N
- C. Personnel wear disposable gloves and protective clothing while handling material ( ) Y ( ) N
- D. Hands monitored after procedures or before leaving ( ) Y ( ) N
- E. No eating, drinking, or smoking in use/storage areas ( ) Y ( ) N
- F. No food, drink, or personal items stored in use/storage areas ( ) Y ( ) N
- G. Use of shielding/distance while using/storing material ( ) Y ( ) N
- H. RAM is under surveillance and control when not in storage in an unrestricted area ( ) Y ( ) N
- Remarks:

12. Posting and Labeling
- A. NRC-3 "Notice to Workers" ( ) Y ( ) N
- B. Parts 19, 20, 21, Section 206 of Energy Reorganization Act, procedures for Part 21, and license documents or a notice indicating where documents can be examined ( ) Y ( ) N
- C. Other posting and labeling requirements met ( ) Y ( ) N
- Remarks:

13. Violations Observed

APPENDIX E - ATTACHMENT B  
RADIOACTIVE DRUG DISTRIBUTORS

N/A

Licensee: \_\_\_\_\_  
Date of Inspection: \_\_\_\_\_

1. Indicate type of operation:

- A. Registered or licensed with  
FDA as a drug manufacturer ( )
- B. Registered or licensed with  
State Agency as a drug manufacturer ( )
- C. Licensed as a pharmacy by State  
Board of Pharmacy ( )
- D. Operating as a nuclear pharmacy within a  
Federal medical institution ( )

2. Licensee distributes

- \* sealed sources ( ) Y ( ) N
- \* alpha and beta emitters ( ) Y ( ) N
- \* generators ( ) Y ( ) N
- \* photon emitters ( ) Y ( ) N

Remarks:

3. Licensee periodically reviews  
work of supervised individuals preparing drugs  
and records kept to reflect work [L/C] ( ) Y ( ) N

Remarks:

4. Radioactive drugs are measured (assayed) by direct  
measurement or combination of measurement  
and calculation prior to commercial distribution  
[32.72(c)] ( ) Y ( ) N

Remarks:

5. Instrumentation Used to Measure Radioactivity of Drugs

- A. List type of equipment used to assay alpha and beta particles:
- B. Procedures for instrument use developed  
and implemented [32.72(c)] ( ) Y ( ) N
- C. Calibration tests performed before initial use,  
periodically, and following repair for accuracy,  
linearity, and geometry dependence as appropriate for  
use of the instrument [32.72(c)(1), L/C] ( ) Y ( ) N
- D. Adjustment to instrumentation made when necessary  
[32.72(c)(1), L/C] ( ) Y ( ) N

E. Instruments are checked for constancy and proper operation at the beginning of each day of use [32.72(c)(2), L/C]

( ) Y ( ) N

Remarks:

6. Transport radiation shield (on transfers for distribution) labelled with radiation symbol, "CAUTION [or DANGER], RADIOACTIVE MATERIAL," name, and quantity at specified date and time<sup>1</sup> [32.72(a)(4)(i), L/C]

( ) Y ( ) N

7. Syringes, vials, or other containers labelled with radiation symbol, "CAUTION [or DANGER], RADIOACTIVE MATERIAL," and an identifier to correlate with the information on the transport radiation shield label [32.72(a)(4)(ii), L/C]

( ) Y ( ) N

Remarks:

**FOLLOWING SECTION APPLICABLE TO LICENSED PHARMACIES OR PHARMACIES WITHIN FEDERAL INSTITUTIONS THAT ARE NOT REGISTERED/ LICENSED BY FDA/STATE AGENCY AS A DRUG MANUFACTURER**

8. Preparation by authorized individuals [35.72(b), L/C]

( ) Y ( ) N

A. Authorized Nuclear Pharmacist (ANP) must meet at least one criteria [32.72(B)(1)]

(1) Qualifies as nuclear pharmacist as defined in 35.2

\* Identified as ANP on NRC or Agreement State nuclear pharmacy license

( ) Y ( ) N

\* Identified as ANP on permit issued by NRC or Agreement State Broad Scope license

( ) Y ( ) N

(2) Listed on license [32.72(b)(2)(ii)]

( ) Y ( ) N

(3) Grandfathered - Listed as authorized user on a nuclear pharmacy license issued by NRC prior to 12/2/94 [32.72(b)(4)]

( ) Y ( ) N

B. Drugs are prepared by ANP or individual under the supervision of an ANP [32.72(b)(1)]

( ) Y ( ) N

C. Licensee has provided NRC with appropriate documentation to support ANP's credentials no later than 30 days after individual starts work as an ANP<sup>2</sup> [32.72(b)(5)]

( ) N/A ( ) Y ( ) N

Remarks:

<sup>1</sup>The time may be omitted for drugs with a half life greater than 100 days.

<sup>2</sup>Not applicable if licensee has obtained a license amendment listing the individual as an ANP. [35.72(b)(2)(ii)]

Clear 591



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
WASHINGTON, D.C. 20555-0001

April 8, 1996

ARMY, DEPARTMENT OF THE  
ATTN: LTC LTC WILLIAM B. JOHNSON  
Radiation Safety Officer  
WALTER REED ARMY MEDICAL CENTER / HSHL-HP/HEALTH PHYSICS OFFICE  
  
WASHINGTON, DC 20307-5001

SUBJECT: ONE-TIME EXTENSION OF LICENSE EXPIRATION DATE  
LICENSE NUMBER 08-01738-03, DOCKET NUMBER 3006895

Dear LTC LTC WILLIAM B. JOHNSON

On January 16, 1996, the Nuclear Regulatory Commission (NRC) amended its regulations in 10 CFR 30, 40, and 70 to extend the expiration date of certain byproduct, source, and special nuclear material licenses by five years (61 FR 1109). The above referenced license was extended by this rulemaking and will now expire on November 30, 2001. Your license will not be amended to show this extended date until the next routine licensing action. Until then, you may provide copies of this letter to vendors and other interested parties as evidence that the license has been extended as a result of the rule.

The extended license authorizes the same activities and contains the same limitations as it previously did. There will be no change in the frequency that the NRC inspects activities authorized by this license.

The amended rules state that in the case of licensees who are granted extensions and who have a currently pending renewal application for that extended license, the application will be considered withdrawn by the licensee and any renewal fees paid by the licensee for that application will be refunded. This will apply to licenses with expiration dates after July 1, 1995, for which renewal applications and the appropriate fees have been submitted and the renewal is still pending. Refunds will be mailed to licensees under separate cover.

All licensees, including those whose renewal applications were withdrawn by this rulemaking, who wish to change their radiation safety programs must request amendment of their licenses to reflect these changes. Amendment requests must include the correct amendment fee since the NRC cannot apply pending renewal refund balances toward amendment fees.

If you have any questions regarding this letter, please contact the individual below.

Frank Costello, Chief Branch 3 - (610) 337-5275

Thank you for your cooperation in this matter.

Sincerely,

A handwritten signature in black ink, appearing to read "D. A. Cool".

Handwritten initials "X/25" in black ink.

Donald A. Cool, Director  
Division of Industrial and Medical Nuclear Safety  
Office of Nuclear Materials Safety and Safeguards

FEB 3 1976

Department of the Army  
Attention: General Robert Bernstein  
Commander  
Walter Reed Army Medical Center  
Washington, DC 20012

License Nos. 08-01738-02  
08-01738-03  
08-01738-04  
08-01738-05  
Inspection No. 76-01

Gentlemen:

This refers to the inspection conducted by Mr. P. Jerman of this office on January 14-16, 1976 at Washington, DC; Forest Glen Section, Silver Spring, Maryland; Fort Detrick, Maryland; and Fort Meade, Maryland of activities authorized by NRC License Nos. 08-01738-02, 03, 04 and 05 and to the discussions of our findings held by Mr. P. Jerman with General G. Baker and LTC B. Adcock of your staff at the conclusion of the inspection.

The inspection was an examination of activities conducted under your licenses as they relate to radiation safety and to compliance with the Commission's rules and regulations and the conditions of your licenses. The inspection consisted of selective examinations of procedures and representative records, interviews with personnel, measurements made by the inspector, and observations by the inspector.

Based on the results of this inspection, it appears that certain of your activities were not conducted in full compliance with NRC requirements, as set forth in the Notice of Violation, enclosed herewith as Appendix A. These items of noncompliance have been categorized into the levels as described in our correspondence to you dated December 31, 1974. This notice is sent to you pursuant to the provisions of Section 2.201 of the NRC's "Rules of Practice", Part 2, Title 10, Code of Federal Regulations. Section 2.201 requires you to submit to this office, within twenty (20) days of your receipt of this notice, a written statement or explanation in reply including: (1) corrective steps which have been taken by you and the results achieved; (2) corrective steps which will be taken to avoid further items of noncompliance; and (3) the date when full compliance will be achieved.

In accordance with Section 2.790 of the NRC's "Rules of Practice", Part 2, Title 10, Code of Federal Regulations, a copy of this letter and your reply will be placed in the Public Document Room.

W.P.C.

*P. Jerman*  
Jerman/lc

*McClintock*  
McClintock

*Nelson*  
Nelson

2/3/76

4/3/76

2/9/76

2/29

APPENDIX A

NOTICE OF VIOLATION

Department of the Army  
Walter Reed Army Medical Center  
Washington, DC 20012  
License No. 08-01738-02

Based on the results of an NRC inspection conducted January 14-16, 1976, it appears that certain of your activities were not conducted in full compliance with NRC regulations and the conditions of your license as indicated below:

- A. Contrary to 10 CFR 20.201(b), you failed to make such surveys (evaluations) as were necessary to assure compliance with 10 CFR 20.101 "Exposure of individuals to radiation in restricted areas." Specifically, you failed to survey or evaluate the exposure to the hands of employees who routinely work with millicurie quantities of phosphorus-32 in your facility at Fort Detrick, Maryland.

This is an infraction.

- B. Condition 23 of your license incorporates, as requirements, the statements, representatives, and procedures contained in your license application dated June 18, 1974. Contrary to Section TPNM-1 of Supplement H of the application which is entitled "Technical Procedure for Assay of 99-Mo Contamination," you failed to make the required assays from January 6 to January 16, 1976 of the molybdenum-99 content in the technetium-99m from your generator.

This is an infraction.

- C. Contrary to 10 CFR 19.11, you failed to post the documents specified in 19.11(a), or a notice describing these documents as referenced in 19.11(b); you also failed to post form NRC-3 as required by 19.11(c).

This item is a deficiency.

-2-

Should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,

Paul R. Nelson, Chief  
Fuel Facility and Materials Safety  
Branch

Enclosure:  
Appendix A, Notice of Violation

cc: LTC B. Alcock

bcc: (w/encls)  
IE Mail & Files (For Appropriate Distribution)  
PDR  
Local PDR  
NSIC  
TIC  
REG:I Reading Room  
District of Columbia

MAR 5 1976

Department of the Army  
Attention: General Robert Bernstein  
Commander  
Walter Reed Army Medical Center  
Washington, DC 20012

License Nos. 08-01738-02  
08-01738-03  
08-01738-04  
08-01738-05  
Inspection No. 76-01

Reference: Your letter dated February 23, 1976  
In response to our letter dated February 3, 1976

Gentlemen:

Thank you for informing us of the corrective and preventive actions you documented in response to our correspondence. These actions will be examined during a subsequent inspection of your licensed program.

Your cooperation with us is appreciated.

Sincerely,

Paul R. Nelson, Chief  
Fuel Facility and Materials  
Safety Branch

bcc:  
IE Mail & Files (For Appropriate Distribution)  
PDR  
Local PDR  
NSIC  
TIC  
REG:I Reading Room  
District of Columbia

*McClintock*  
McClintock/jb  
31/4/76

*Nelson*  
Nelson  
31/5/76

2/30



DEPARTMENT OF THE ARMY  
WALTER REED ARMY MEDICAL CENTER  
WASHINGTON, D.C. 20012

REPLY TO  
ATTENTION OF:

HSW-YHP

23 FEB 1976

SUBJECT: Nuclear Regulatory Commission Inspection 76-01

Nuclear Regulatory Commission, Region I  
ATTN: Chief, Fuel Facility and Materials  
Safety Branch  
631 Park Avenue  
King of Prussia, PA 19406

1. Pursuant to the provisions of Section 2.201, Part 2, Title 10, Code of Federal Regulations, the following is in reply to your Commission's inspection (No 76-01) of this facility on January 14 - 16, 1976.

a. Individuals were working in a Biological "Hot" Suite with 5 mCi of Phosphorus 32. Work with the isotope by procedure was performed through a glove box and due to the short time of exposure, it was determined that monitoring of the hands was not required. The hands of the above individuals are now being monitored. There is a continual evaluation of exposure of individuals to radiation in restricted areas which includes: personnel dosimetry, survey and monitoring of work areas, monthly review and evaluation of exposure reports and bioassays as required.

b. Failure to make required assays was due to equipment failure which had been replaced by new equipment at the time of inspection. The original equipment has been repaired and will be used as a backup system which should preclude the reoccurrence of this infraction.

c. Required documents or notices were posted at the cited location immediately after the departure of the inspector. Continual evaluation is being made to assure that this information is readily available to all radiation workers.

2. Walter Reed Army Medical Center is in full compliance with all Nuclear Regulatory Commission Licenses held by this Command.

*Robert Bernstein*  
ROBERT BERNSTEIN, MD  
Major General, MC  
Commanding



Commander



M.G.

George I  
Baker

Plan approved: \_\_\_\_\_ Date: \_\_\_\_\_

Licensee: \_\_\_\_\_

License no: \_\_\_\_\_

Inspection Items	Scheduled for Inspection	Post-Inspection status	Module no.	755 Time Info
Management meeting - Entrance and Exit Interviews <i>[REQUIRED]</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	307038	1 hr
Initial Management Meeting				
Program requirements, MC 28 <u>60</u> <i>[REQUIRED]</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	777108	3 hr
Licensee Event Followup			927008	
Followup on Inspector-identified problems			927018	
Followup on Noncompliance and Deviations			927028	
IE Bulletin/Immediate Action Letter Followup			927038	
Followup on Headquarters Requests			927048	
Followup on Regional Requests			927058	
Independent Inspection Effort <i>[REQUIRED]</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	927068	4 hr
Inspector Dispatched to Site			937008	
Followup on Significant Event Occurring During Inspection			937018	

~~3 Jan~~  
~~21 May~~  $7.6 \times 10^{-11}$  ~~plu/cc~~  
"Weekly stack" ~~7.5%~~

29 Oct  $1.99 \times 10^{-9}$  plu/cc  
20 Nov  $-10$

22 Oct  $5.22 \times 10^{-10}$   
29 Oct

10 Sept  
22 Oct  $3.4 \times 10^{-10}$

27 Aug  $5.18 \times 10^{-10}$

13 -  
27 Aug  $8.17 \times 10^{-10}$

30 Jul  
13 Aug  $6.9 \times 10^{-12}$

18 Jul  $1.8 \times 10^{-10}$   
30

3 Jan  
21 May }  $5.4 \times 10^{-10}$  plu/cc

→ Dr. Beisel

AREAS INSPECTED AND FINDINGS

Licensee: \_\_\_\_\_ License no: \_\_\_\_\_ Amendment no: \_\_\_\_\_

INSPECTION ITEMS	CRITERIA	FINDING
------------------	----------	---------

1. Organization

Lic Cond \_\_\_\_\_

C

Management organization.  
Radiation protection organization.

NOTES & REMARKS:

*W Reed ultimately responsible  
planning to send ~~one~~ 1 person for 1 day/week  
to oversee & help w/ HP  
onsite HP techs not well trained ~~but~~  
by W Reed but very bright & doing a decent  
job*

2. Licensee internal audits

Lic Cond \_\_\_\_\_

C

Scope and frequency.  
Management controls.

NOTES & REMARKS:

3. Training and instructions to employees

Lic C

C

Training program, scope and frequency,  
retraining.  
Required tests administered; scores  
satisfactory.  
Instructions to workers.

Lic Cond \_\_\_\_\_

19.12

NOTES & REMARKS:

4. Radiation protection procedures

Lic Cond \_\_\_\_\_

C

Operating & emergency procedures  
implemented.  
Security.

20.207

NOTES & REMARKS:

MS sensitivity  
 $MS = 2.5 \times 10^{-6}$

Mr. Roy Lovett  
HP Tech

MDA = 11.18 cpm

Charcoal filters for samples  
on I hoods

$4 \times 10^{-7}$  nCi/cc

May 23 79

Animals

(2 shipments) 5 drums from April

(Mr. Urbanski)

effluent inside cont

125 I  $8 \times 10^{-11}$   
I  $5.6 \times 10^{-9}$

AREAS INSPECTED AND FINDINGS

Licensee: \_\_\_\_\_ License no: \_\_\_\_\_ Amendment no: \_\_\_\_\_

INSPECTION ITEM	CRITERIA	FINDING
-----------------	----------	---------

5. Materials, facilities and instruments

Authorized uses and quantities.	Lic Cond _____	<u>C</u>
Restricted areas, posting requirements.	20.205	
Survey instruments & dosimeters; operable, properly calibrated.	Lic Cond _____	

NOTES & REMARKS:

6. Receipt and transfer of materials

Procedures implemented, adequate.	20.205, 71.57	<u>n/c</u> 4/22 surveys of incoming pkg
Transfer of byproduct material.	30.41	
Labeling and packaging.	71.5, 49CFR 170-189	
Records of receipt, transfer, storage, survey, and monitoring	30.51	

NOTES & REMARKS:

*all ordered thru W Reed & delivered to H/P 5/11*

7. Personnel protection - external

Personnel monitoring control; minimize exposures, control of accumulated dose.	20.101, 20.102, 20.202	<u>C</u>
Surveys conducted, adequate.	20.201	
Records of monitoring, surveys, disposals.	20.401, Lic Cond _____	
Levels in unrestricted areas.	20.1, 20.105	

NOTES & REMARKS:

8. Personnel protection - internal

Airborne concentrations in restricted areas.	20.103	<u>n/c</u> no records of surveys after decon of hot areas
Exposure of minors.	20.104	
Posting of airborne radioactivity areas.	20.203	
Survey, monitoring requirements; records.	20.201, 20.401	
Leak tests of sealed sources.	Lic Cond _____	

NOTES & REMARKS:

hoods -

ind. meas -

thyroid counts - bioassays

~~7/11/17~~ survey records

receipt records

disposal records

training

~~surveys nt~~  
1/9 - 12/17

no meter

effluent record

Film badges  
tomorrow  
resurvey  
records

3 new irradiators - both enclosed

old <sup>60</sup>Co irradiator - trying to get rid of

not now being used

quarterly inventory by investigator -

Dec 11, 78 300,000 dpm  
125 I

Walter Reed checks out new Procedure  
883 irradiators

AREAS INSPECTED AND FINDINGS

Licensee: \_\_\_\_\_ License no: \_\_\_\_\_ Amendment no: \_\_\_\_\_

INSPECTION ITEM	CRITERIA	FINDING
-----------------	----------	---------

9. Effluent control, waste disposal

Release of effluents.  
Waste disposal.  
Procedures, records.

20.106  
20.301, 20.303, 20.304, 20.305  
20.407, Lic Cond \_\_\_\_\_

*evaluator of NRC  
surveys for  
I-125  
not complete  
measuring ~ 10<sup>-10</sup> µCi/ml in hood  
continuously*

NOTES & REMARKS:

10. Shipping, shipping incidents

Procedures for pickup, receipt, monitoring of packages.  
Transportation of licensed material.  
Incidents, reports, corrective actions.

20.205(b) & (c)  
71.5  
49CFR 170-189

NOTES & REMARKS:

11. Notifications and reports

To individuals.  
Overexposures, excessive levels & concentrations, incidents.  
Personnel exposures and monitoring, termination reports.  
Theft or loss of licensed material.

19.13  
20.403, 20.405  
20.407, 20.408  
20.402

NOTES & REMARKS:

12. Posting of notices

Part 20, license & documents, procedures, notice of violations.  
NRC-3.

19.11(a)  
19.11(c)

NOTES & REMARKS:

UPS - to USAMRIID's

supply area

Supply person ~~is~~ will call

Beckwith & staff

Order signed by Wannamaker & Beckwith

log of orders placed

receipt signed by user or tech

outside reading  
outside swipe

> 100  $\mu$ ci

I > 10

W Reed Calibrates Survey  
Meters for USAMRIID

(supplies survey eq.)

soon to  
have

1 ind. from WR for 1 day/week

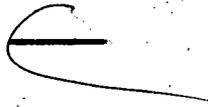
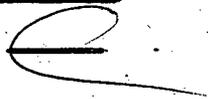
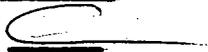
USAMRIID - Safety Office Tech <sup>Glen</sup>  
performs checks of <sup>hoods</sup> airflow & filters <sup>Gronne</sup>

recommend  $\rightarrow$  pkg monitoring  
on each & every pkg

AREAS INSPECTED AND FINDINGS

777103 - Industrial-Academic

Licensee: \_\_\_\_\_ License no: \_\_\_\_\_ Amendment no: \_\_\_\_\_

INSPECTION ITEM	CRITERIA	FINDING
<p>13. <u>Environmental monitoring program</u></p> <p>Implementation of program, scope and frequency as required.</p> <p>Records maintained, reviewed by management.</p> <p><b>NOTES &amp; REMARKS:</b></p>	Lic Cond _____	
<p>14. <u>Emergency preparedness</u></p> <p>Procedures available for incidents and accidents.</p> <p>Training for personnel; coordination with supporting groups and agencies.</p> <p><b>NOTES &amp; REMARKS:</b></p>	Lic Cond _____	
<p>15. <u>Other license conditions</u></p> <p><b>NOTES &amp; REMARKS:</b></p>	Lic _____	_____
<p>16. <u>Confirmatory measurements</u></p> <p>Licensee's surveys verified on sampling basis.</p> <p><b>NOTES &amp; REMARKS:</b></p>	20.105, 20.201	
<p>17. <u>Independent inspection effort:</u></p> <p><b>NOTES &amp; REMARKS:</b></p>		_____

32P

~ user

8 weeks of  
32P infects

~ 100 mCi

Survey meters + Ring, wrist, & body  
24 hr urine

125

I monthly thyroid counts

~ 35 persons on auth.

12-13 actually working

APPENDIX A - DOCUMENTATION OF NONCOMPLIANCE

Licensee: \_\_\_\_\_

License no: \_\_\_\_\_

Reference	Basis for noncompliance
Report item <u>1</u> 10 CFR _____ Lic Cond _____ Type n/c _____	<i>inf - failure to perform glm surveys on incoming package</i>
Report item <u>2</u> 10 CFR _____ Lic Cond _____ Type n/c _____	<i>20.201 re 20.106 of evaluation of effluent            Call Walter Reed</i>
Report item <u>3</u> 10 CFR _____ Lic Cond _____ Type n/c _____	<i>def - records of surveys after decon.</i>
Report item _____ 10 CFR _____ Lic Cond _____ Type n/c _____	<i>(recommend ring badges records ce sent to Birkwith)</i>
Report item _____ 10 CFR _____ Lic Cond _____ Type n/c _____	

he also handles <sup>packages</sup> waste  
to Toney

PKg comes to AMRIID  
directly

St. Beckwith - routine basis  
surveys

Now Co-users do that surveying  
daily during use

---

Infectious Disease Work  
32p handled  
in high containment area  
inside - to do RNA tagging  
dilute w/ formaldehyde to kill organism  
then treated as RAM waste

No Clinical

Dr Wimmeracker

APPENDIX B - LICENSEE ACTION ON PREVIOUS INSPECTION FINDINGS

Licensee: \_\_\_\_\_

License no: \_\_\_\_\_

Identification and summary of action taken	Status
Report no: _____ Type n/c: _____ Describe: _____	
Action taken:	OPEN
	CLOSED
Report no: _____ Type n/c: _____ Describe: _____	
Action taken:	OPEN
	CLOSED
<i>Clear</i> <u>A-01</u>	
Report no: _____ Type n/c: _____ Describe: _____	
Action taken:	OPEN
	CLOSED
Report no: _____ Type n/c: _____ Describe: _____	
Action taken:	OPEN
	CLOSED
Report no: _____ Type n/c: _____ Describe: _____	
Action taken:	OPEN
	CLOSED

largest  $\Sigma$  use  
1000s

<sup>32</sup>P - tagging

Dr. Beisel - RPO

Dr. Wanamaker - coordinates  
as Principle Users

CO users

techs.

Centralised uses  
4 glassware washing  
1 tissue area

Dr. Wanamaker signs requests,  
sent to Walter Reed

all receipt thru St. F<sup>st</sup> Class  
Beckwit

at Ft. Detrick

he issues it to user

APPENDIX C - SUPPLEMENTARY INFO

Licenses: \_\_\_\_\_

License no: \_\_\_\_\_

- 
- Uncorrected/repeated noncompliance
  - Unusual occurrence, conditions, etc
  - Basis for change of Category or Priority

- Unresolved items
  - Inspector's comments
-

-05

For storage only at Ft Detrick  
until July 1980

50 Ci  $^{60}\text{Co}$  JL Shepherd  
irradiator

-02 see supplement "E" also req for bioassay

-03 irradiator

leak tests on sealed sources

How are users evaluated

(Medical Dispensary Wnd 200)

ordering thru Scientific Advisor  
receipt @ Medical Supply office

All ordering thru Walter Reed  
(Col Quilan @ WR)

301-427-5161

All HP thru Walter Reed

strictly lab & animal usage  
biochem + physiological

$^{14}\text{C}$ ,  $^3\text{H}$  compound

$^3\text{H}$   $^{32}\text{P}$  ( $^{131}\text{I}$ )  $^{125}\text{I}$   
tag

AECCL

① Gamma Cell (2)  
 01/28-03  
 Ft Dietrich Md  
 install Gamma Cell 220  
 Bldg 1425 Rm AAH3

---

② Watter Reed  
 Sept  
 Co 60 - 25000 Ci 19-25  
 Go Leeson  
 54-00500-12

---

install Gamma Cell  
 40  
 3490 Ci  
 Farrest Glen  
 2000 Bld 500 Stecton  
 Garon Model 220 trans to AECCL

My  
 Dietrich  
 Ft  
 Md  
 Pull Folder  
 do we know  
 what's  
 there

Col  
 MR

Ft. Meade

Bob

LICENSEE: DEPARTMENT OF THE REPORT NO. 90-001

ADDRESS: ARMY - WALTER REED  
MEDICAL CENTER  
WASHINGTON DC 20307-5001

LICENSEE CONTACT: LT. COL MYERS TELEPHONE NO. \_\_\_\_\_

LICENSE NUMBER	DOCKET NUMBER	CATEGORY	PRIORITY	PROGRAM CODE
<u>08-01738-02</u>	<u>030-01317</u>	<u>G1</u>	<u>1</u>	<u>02110</u>
<u>08-01738-03</u>	<u>030-06895</u>	<u>E</u>	<u>3</u>	<u>03520</u>

INSPECTION DATE (S) Feb 6-7-8, 1990 TYPE OF INSPECTION

LOCATION(S) Washington DC  
Forest Glen MD

- SPECIAL  ROUTINE  
 ANNOUNCED  UNANNOUNCED  
 DAYSHIFT  BACKSHIFT

SUMMARY OF FINDINGS AND ACTION

- NO NONCOMPLIANCE, 591   
 NO NONCOMPLIANCE, LETTER   
 NONCOMPLIANCE, 591  
 NONCOMPLIANCE, LETTER

ACTION ON PREVIOUS NONCOMPLIANCE,  
APPENDIX B  
SUPPLEMENTAL INFORMATION, APPENDIX C  
APPENDIX C

*Includes Medical Field Notes*

PERSONS CONTACTED (Name, Title)

- \* COL Peck, Acting Deputy, Comdr
- + LTC Myers, Chief of Health Physics
- \* MAJ Terry Minton, Nuc Pharmacist
- 2LT Allen Anthony, RSO  
HAB Tech Services
- LT Cummings, HAB Operations
- Mr. Burton, HAB Rad Materials Control
- \* attended exit meeting

- Ralph Kyle, Chief Writ
- Dr. Anderson, Chief of Nuc Med
- Dr. Cyrus Mazerod, Med Physicist
- Jesse Martin, Dr. Frances Carr  
Metabolic Studies
- David Drotzler (blood irradiation)
- Sgt. Olson, Simmons, Moses, Lewis
- E. Richardson

[Signature] 2/4/90  
Inspector Signature, Date

Inspector Signature, Date

APPROVED [Signature]  
Signature, Date

5/10/90

2/59

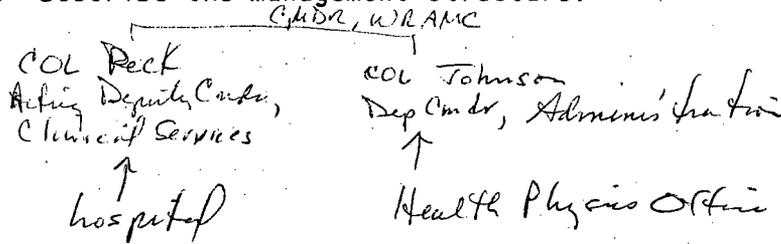
RESULTS

1. ORGANIZATION

(C) NC

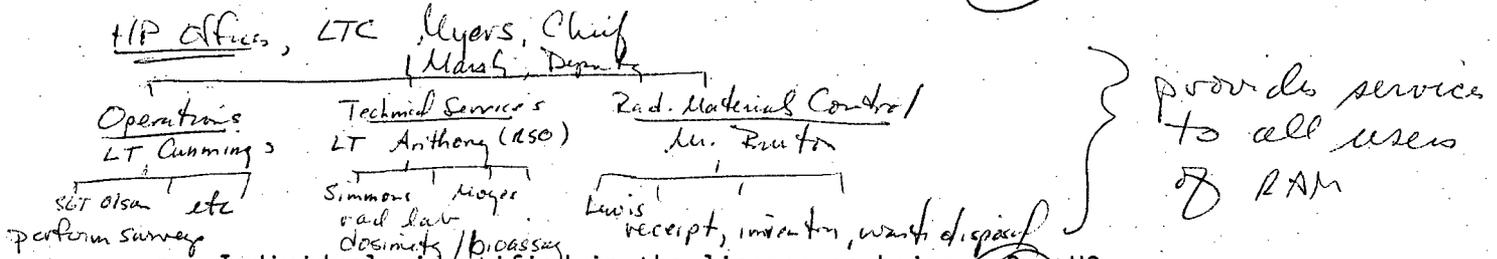
a. Describe the management structure.

(C) NC



b. Describe the radiation protection organization.

(C) NC



c. Individuals identified in the license as being responsible for the programs still hold these positions.

(C) NC

d. Radiation Safety Committee operates as required.

(C) NC NA NI

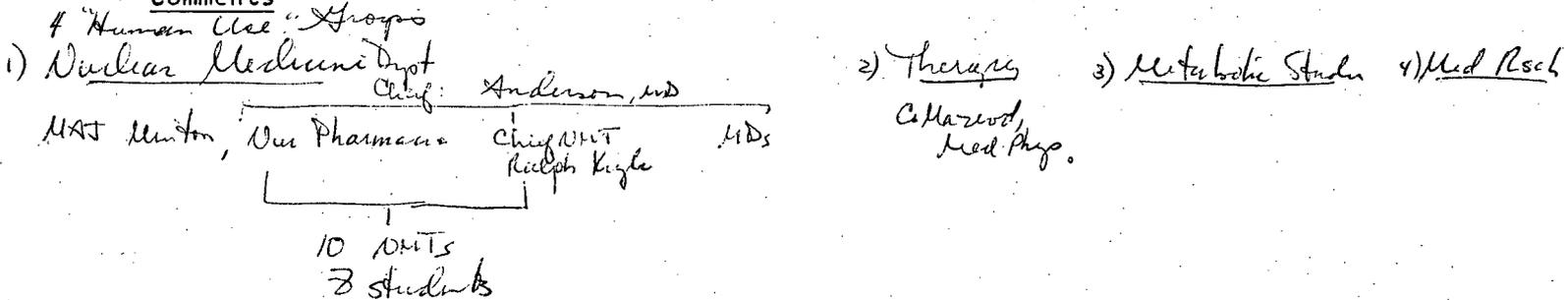
1. meeting frequency: at least quarterly
2. records maintained (Y/N/na/ni)
3. records reviewed by inspector for period June 1988 to January 1990
4. required persons in attendance (Y/N/na/ni)

e. Management control programs conducted as required.

(C) NC NA NI

1. records maintained (Y/N/na/ni)
2. Describe scope, frequency, etc.

Comments



Other: R&D at WRAR, Ft. Detrick

## RESULTS

## 2. SCOPE OF LICENSED ACTIVITIES

C NC

## a. Describe the types of current activities.

C NC

Hospital : 1) Nuclear Med / RIA lab , iodine therapy  
 2) Brachytherapy (Co-60, Ir-192, I-125)  
 3) bone mineral analysis  
 4) teaching/training of NMTs

R&D : WARR building and Forest Hill location : vertebral studies,  
 lodination, microencapsulations, some animal studies  
 Some medical research

b. Describe the current workload in terms of number of workers, quantities of radioactive material used each week/month/year, frequency of use, other appropriate information.

1. ~400 lab rooms; 700± rad workers across 80 user groups
2. 15-20 packages of RMI delivered each day including RPA kits, mCi-mCi quantities CHIPS, and for Nuc Med deliveries.
3. 20-30 lodinations per year. Occasional use of microsphere
4. See attached Medical field notes for Hospital use

c. Describe any changes since the last inspection, and any which may be planned.

Considering having all RMI for Nuc Med delivered directly to Nuc Med

Comments

Planning to build new facility for HPOffice, at site of former reactor building. This building currently used for waste handling. The new building would be placed behind this facility.

RESULTS

3. TRAINING AND INSTRUCTIONS TO EMPLOYEES	(C) NC		
a. Instruction to all persons working in a restricted area (19.12).	(C) NC		
b. Additional required training for users and other specified workers.	(C) NC	NA	NI
1. approved training program	y/n/na/ni		
2. training provided by <u>HP Office</u>	y/n/na/ni		
3. users complete on-the-job training	y/n/na/ni		
4. tests are given			
a. written	y/n/na/ni		
b. oral	y/n/na/ni		
c. practical	y/n/na/ni		
d. records of tests maintained	y/n/na/ni		
e. deficiencies noted	y/n/na/ni		
5. test results reviewed by NRC inspector for period _____ to _____	y/n/na/ni		
c. Periodic training is implemented as required.	(C) NC	NA	NI
1. records of retraining maintained	(y/n/na/ni)		
2. Describe frequency and scope of periodic training			
d. Employees interviewed appeared familiar with safe handling practices and other requirements.	(C) NC	NA	NI

Comments

Workers interviewed appeared familiar with rad safety procedures  
 RCC minutes listed all training courses given each quarter (usually 6-12 covering nurses, ancillaries, Nu Med, etc)

No review of training records for individuals was performed.

## RESULTS

## 4. MATERIALS

a. Radioactive material as authorized by license.

C NC

C NC

1. type and quantity authorized

y/n

2. inventory records maintained

y/n/na/ni

3. inventory records reviewed for

period June 1989 to December 1989

b. Control of source material (Part 40) and special nuclear material (Part 70) as required.

C NC NA NI

1. transfers in accordance with 40.51/70.42, 70.54

y/n/na/ni

2. records and inventory required by 40.61/70.51

y/n/na/ni

3. reports in accordance with 40.64/70.53, 70.54

y/n/na/ni

CommentsBlood irradiator ~~in the~~ on 4th floor at hospital

1 GammaCell 220 and one GammaCell 40 in basement of GAR

1 GammaCell 220 and one GammaCell 40 at Ft. Detrick

Bone-mineral analyzer: Co-57, Iodine and Au-198 sources

Brachy storage in first floor of hospital for Co-57 needles, <sup>(2)</sup> Ir-192 and/or Ir-192 prior to return, and Co-57 eye app.

Inventory maintained

1) by auth. user, ~~updated~~ material added onto authorization on receipt, deleted only at 6-month inventory. No credit taken for decay.

2) sealed source inventories maintained by HP office.

No Au-198 on hand.

## RESULTS

## 5. FACILITIES MAINTAINED AS DESCRIBED IN APPLICATION

- |   |              |               |           |
|---|--------------|---------------|-----------|
|   | <del>C</del> | <del>NC</del> |           |
| a. postings and labelings as required   | <del>C</del> | <del>NC</del> |           |
| 1. 20.203(b) radiation area   |              |               | y/n/na/ni |
| 2. 20.203(d) airborne radiation area  |              |               | y/n/na/ni |
| 3. 20.203(e) use or storage areas posted with "Caution - Radioactive Material"        |              |               | y/n/na/ni |
| 4. 20.203(f) containers and devices properly labeled                                  |              |               | y/n/na/ni |
| 5. 19.11(a)(b) posting of documents   |              |               | y/n/na/ni |
| 6. 19.11(c) posting of NRC-3  |              |               | y/n/na/ni |
| 7. 20.203(c) high radiation areas   |              |               | y/n/na/ni |
| b. Security of licensed material is maintained.                                       | C            | NC            |           |
| 1. locked in device cabinet or room   |              |               | y/n/na/ni |
| 2. secured to prevent unauthorized removal from an unrestricted area                  |              |               | y/n/na/ni |
| 3. devices and materials secured at field location                                    |              |               | y/n/na/ni |
| c. High Radiation Area operated as required.  | C            | NC            | NA NI     |
| 1. posted as required by 20.203(c)(1)   |              |               | yes/no    |
| 2. interlocked as required by 20.203(c)(2)(i)   |              |               | yes/no    |
| 3. entrance controlled in accordance with 20.203(c)(2)                                |              |               | yes/no    |
| 4. exit controlled in accordance with 20.203(c)(3)                                    |              |               | yes/no    |
| 5. surveillance or locked to prevent unauthorized entry as required by 20.203(c)(4)   |              |               | yes/no    |
| 6. visible and audible signals operate correctly to warn of the presence of radiation |              |               | yes/no    |
| 7. alarm tested at required intervals   |              |               | yes/no    |
| 8. records of alarm system test maintained  |              |               | yes/no    |
| 9. exposure devices and storage containers meet radiation level limits of 20.203      |              |               | yes/no    |

Comments

- b. Hallways in WHAIR beginning to be used for locating RAN refrigerators and freezers due to lack of space. Most have locks/chain for security of material

RESULTS

6. INSTRUMENTS, EQUIPMENT, AND DEVICES

C NC

a. calibrated and operable meters available and used properly.

C NC NA NI

1. number, type, and ranges (e.g. 2, ion chamber, 1R/hr; 3, GM, 10,000 cpm)

Number	Type	Range

- 3. calibrated by: RSO Inc
- 4. calibration method as authorized
- 5. calibration interval annual as required
- 6. Records reviewed by NRC inspector for the period \_\_\_\_\_ to \_\_\_\_\_

y/n/na/ni

y/n/na/ni

b. other special equipment (ventilation, hoods, shielding, etc) operable and available as described in license. Description:

C NC NA NI

radiation hood - flow rates checked  
Each hood has 3 samplers: 1) breathing zone  
2) room air 3) stack-to-environment

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Comments

Each lab had at least one operable pump meter, usually a pancake GM. All have current calibration stickers.

## RESULTS

- | 7. RECEIPT AND TRANSFER OF MATERIALS  | C | NC | NA        | NI |
|---|---|----|-----------|----|
| a. Procedures for picking up, receiving, and opening of packages performed as required by 20.205. | C | NC | NA        | NI |
| 1. written procedures available   |   |    | y/n/na/ni |    |
| 2. procedures approved in application   |   |    | y/n/na/ni |    |
| 3. survey of packages when received   |   |    | y/n/na/ni |    |
| 4. 20.401 records of survey of packages   |   |    | y/n/na/ni |    |
| 5. 20.401 records of receipt of packages  |   |    | y/n/na/ni |    |
| b. Licensed material transferred as required.   | C | NC | NA        | NI |
| 1. 30.41 verification of recipient's license  |   |    | y/n/na/ni |    |
| 2. 20.401, 30.51 records of transfer maintained   |   |    | y/n/na/ni |    |
| 3. Licensee makes shipments of radioactive materials.   |   |    | yes/no    |    |
| a. delivered by common carrier  |   |    | yes/no    |    |
| b. transported in licensee's own vehicle as a private carrier.                                    |   |    | yes/no    |    |

\*IF ABOVE IS ANSWERED "YES", COMPLETE 7.A TRANSPORTATION

COMMENTS

licensee transports RAM packages from HP Office at Fort Glenn (including Tc-99m generators) to the hospital and WARR in Washington D.C. And transports waste from D.C. to Fort Glenn. Vehicle is licensed, all waste transported as "LSA"

7.A. TRANSPORTATION	RESULTS			
	C	NC	NA	NI
1. Are authorized packages used	173.415-416		yes/no	
2. Types of packages used (for example, DOT-7A)	173.415			
3. Performance test records on file	173.416(a)		yes/no	NI
4. Licensee aware of 6/30/85 cutoff on use ( ) certified	173.416(b)		yes/no	
5. NRC COC's on file	71.12(c)(1)		yes/no	
6. Registered with NRC as user	71.12(c)(3)		yes/no	
7. Documented NRC-approved Q/A program? NRC Q/A Approval number _____	71.12(b)		yes/no	
8. Special Form Material Performance test records available for each source design	173.476(a)		yes/no/na	
9. packages labeled as required	172.403 (a-f)		yes/no	
a. Excepted				
b. White I				
c. Yellow II				
d. Yellow III				
10. Surveys performed to select correct label category and compliance with radiation limits	175.475(i)		yes/no	
11. Packages marked as required with	172.300-310		yes/no	
a. shipping name			yes/no	
b. Spec No.				
c. Certificate of Compliance (COC) No. etc.				
12. Shipping papers are prepared for each shipment	172.200		yes/no	
13. Shipping papers contain required information	172.203(d)		yes/no	
14. For private carrier shipments:				
a. vehicles placarded as required	172.500,504		yes/no	
b. cargo blocked, braced, tied down in vehicle	177.842(d)		yes/no	NI
c. any incidents reported to DOT	171.15-16		yes/no	no incidents
15. Licensee carries shipping papers that are readily accessible when transporting radioactive material				

Comments

RESULTS

8. PERSONNEL MONITORING

C  NC  NA  NI

a. Personnel dosimetry assigned and worn as required.  C  NC  NA  NI

- 1. whole-body dosimeter used  y/n/na/ni
  - a. \_\_\_\_\_ film X TLD
  - b. exchange frequency: Monthly
  - c. supplier Army - Lexington Ky
  - d. supplier NVLAP accredited 10 CFR 20.202  y/n/na/ni
- 2. extremity dosimetry used  y/n/na/ni
- 3. workers observed wearing required dosimetry  y/n/na/ni

b. Personnel dosimetry reports maintained as required  C  NC  NA  NI

- 1. records reviewed by management frequency:  y/n/na/ni
- 2. on receipt; quarterly at RCC meeting  
NRC inspector reviewed personnel monitoring records from Dec 88 to Oct 89  y/n/na/ni
  - a. whole body quarterly dose: typical 0 max \_\_\_\_\_
  - b. extremity quarterly dose: typical 0 max 1
- 3. Forms NRC-4, NRC-5 or equivalent records completed  y/n/na/ni
- 4. Termination and annual reports to individuals and NRC, as required  y/n/na/ni

c. Formal ALARA program is implemented  C  NC  NA  NI

Comments

Operations Branch provides a list each week to Tech Services Branch  
 of individuals who require bioassay. Individual are  
 contacted if they do not come in when fairly.

RESULTS

9. RADIATION AND CONTAMINATION SURVEYS

(C) NC

a. Radiation and Contamination surveys

(C) NC NA NI

- 1. radiation and contamination surveys recorded
- 2. surveys performed at required frequency: uses daily when used
- 3. appropriate instruments used
- 4. action limits observed, and post-decontamination surveys performed when necessary
- 5. NRC inspector reviewed survey records for the period Jan 1989 to Jan 1990
- 6. maximum radiation levels in unrestricted area: 10.05 mR/h

(y)n/na/ni  
 (y)n/na/ni  
 (y)n/na/ni

(y)n/na/ni  
 Selected all records for specified labs:

b. Airborne Radioactivity Surveys performed

(C) NC NA NI

- 1. Air sampling in restricted areas
  - a. maximum concentration levels: 1E-11 uCi/ml
  - b. typical concentration levels: <MDA
- 2. bioassay procedures performed
  - a. type(s) Thyroid scan
  - b. maximum results 5/89 35 nCi I-125
  - c. typical results
- 3. bioassay and air sampling records maintained as required
- 4. Principal isotopes I-125 I-131

y/n/na/ni  
 (y)n/na/ni

I-131 (New) max 1E-10 uCi/l  
 4yp E-12 uCi/l  
 Individual use of isotopes eventually revoked 11/89

c. Leak tests of sealed sources performed as required

(C) NC NA NI

- 1. performed by user and method approved
- 2. tested at required interval: 6-mo except 2 and 3 weekly (quoted)
- 3. records maintained
- 4. records reviewed by NRC inspector for the period Jan 89 to Jan 90

(y)n/na/ni  
 (y)n/na/ni  
 (y)n/na/ni

Comments

9.2. weekly: all labs w/ potential to exceed ALARA limits, e.g. iodination labs, Nuc Med  
 monthly: all authorized use areas  
 quarterly: selected common areas such as bathrooms, hallways, elevators, lunch rooms.

performed by HP Office

RESULTS

10. EFFLUENT CONTROL, WASTE DISPOSAL

- a. Releases to the environment in accordance with requirements.  C NC NA NI
  - 1. airborne releases are made  y/n/na/ni
    - a. evaluations adequate  y/n/na/ni
    - b. releases within limits (10 CFR 20.106)  y/n/na/ni
    - c. typical concentrations
    - d. principal isotopes released I-125 and I-131
  - 2. liquid releases are made to sewer (sewer, unrestricted)  y/n/na/ni
    - a. evaluations adequate  y/n/na/ni
    - b. releases within limits (10 CFR 20.106, 10 CFR 20.303)  y/n/na/ni
    - c. typical concentrations E-8 uCi/ml
    - d. principal isotopes released <sup>3</sup>H, <sup>5</sup>-<sup>35</sup>S
  - 3. Records maintained  y/n/na/ni

b. Waste disposal in accordance with requirements  C NC NA NI

- 1. methods: sewer disposal  
transfer to broken  
storage-for-decay
- 2. records of waste transfer maintained  y/n/na/ni
- 3. surveys of waste containers and material in storage-for-decay performed  y/n/na/ni
- 4. obliteration of labels  y/n/na/ni

c. Burial of licensed material done in past Yes  No

- 1. Location of past burials \_\_\_\_\_
- 2. types of materials buried \_\_\_\_\_
- 3. types of surveys of area, results: \_\_\_\_\_

d. 10 CFR 61 Requirements Reviewed y/n/na  ni

Comments

Total 1989:	225 mCi H-3	6814 L total volume of sample	sample conc 3.3 E-5 uCi/ml	3.7 E7 ml	OK 6.1 E-8 uCi/ml
	7 mCi C-14		1.0 E-6		1.9 E-9
	200 mCi other		2.9 E-5		5.4 E-7

Main Post Sewer volume: 7 E9 ml/day → 2.6 E12 ml/yr  
 Joint Effluent: 1 E7 ml/day → 3.7 E9

RESULTS

11. NOTIFICATIONS AND REPORTS

C NC NA NI

1. Licensee is in compliance with

- a. reports of thefts or losses (20.402)
- b. reports of incidents (excessive releases, fires, or other catastrophes) (20.403)

y/n/na/ni  
y/n/na/ni

2. Licensee took appropriate action in response to the following Bulletins, Circulars, and Information Notices.

y/n/na/ni

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_

Comments

No reportable incidents. Spill and ALARA reviews documented  
 One package missing from auth user inventory record determined to  
 have been used, not missing.  
 One coordinator had privileges revoked for repeated contamination  
 incidents. One such contamination resulted in max thyroid  
 burden of 35 mCi.

## RESULTS

12. OTHER LICENSE CONDITIONS

C	NC	NA	NI
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

List any other license conditions which were reviewed during the inspection, and describe the results.

a. Item 9 Authorized Max  NC

license needs to request a  
"Corrected Copy" as no  
was listed for Items AA and BB

b. L/C 12 B and C

C	NC	NI
<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

Not reviewed

c. Lic No. 08-01738-03

C	NC
<input checked="" type="radio"/>	<input type="radio"/>

Condition 10: location for Blood Irradiator  
is at WRAMC. This was omitted from  
license, and is process of being amended

Comments

RESULTS

13. INDEPENDENT AND CONFIRMATORY MEASUREMENTS

C NC NA NI

a. Type of Survey

Areas Surveyed

Results  
(indicate units)

1. Radiation level

Nuc Med-Pharmacy room 20.1 mR/h  
- injection prep room 20.1 mR/h  
- camera rooms 20.05 mR/h bkg  
- halls 20.05 mR/h  
- techs office 20.05 mR/h

2. ~~Wipe~~

Brachy Storage Area 20.05 mR/h  
Blood Irradiator - contact 0.15 mR/h  
- room bkg  
Labs: 4<sup>th</sup> floor (Carr) 20.05 mR/h

3. ~~Sample (describe)~~

WRAIR-106. labs 20.05 mR/h  
halls, refs etc 20.05 mR/h  
irradiator room - contact (40) 20.1 mR/h  
- contact (200) 20.2 mR/h  
Waste Bldg - storage for film area bkg → 5 mR/h  
- compact 20.1 mR/h

4. Attach any sample analysis data from Region I laboratory

- sealed source storage bkg → 5 mR/h  
Calibration Source Storage Bldg - inside 20.05 mR/h  
- outside 20.05 mR/h  
- LSA drum max 0.5 mR/h  
- waste freez room 20.05 mR/h

b. Survey Instruments Used

1. Type

a. Juddon 34C

b. \_\_\_\_\_

2. NRC #

a. 09664

b. \_\_\_\_\_

3. last calibration date

a. \_\_\_\_\_

b. \_\_\_\_\_

Comments

1. ORGANIZATION

a. Organizational structure meets license requirements.  Yes ( ) No  
[L/C]  
Remarks.

b. Use supervised by authorized individuals. ( ) Yes ( ) No [35.22(b)(2)]  
Remarks.

*Not inspected*

c. Radiation Safety Committee meets at quarterly intervals.  
 Yes ( ) No

(1) Membership in accordance with 35.22(a)(1)]  Yes ( ) No  
Remarks.

(2) Record of Committee meetings.  Yes ( ) No [35.22(a)(4)]  
Remarks.

(3) Consultants. ( ) Yes  No  
Remarks.

e. Licensee uses the services of a visiting authorized user. *Not inspected*  
( ) Yes ( ) No [35.27(a)]

(1) Licensee has a copy of visiting authorized user license.  
( ) Yes ( ) No [35.27(a)(2)]

(2) Licensee has records (maintained for 2 years) of visiting authorized users  
last visit. ( ) Yes ( ) No [35.37(c)]

f. Licensee utilizes mobile nuclear medicine services.  
( ) Yes  No [35.29]

g. Licensee delegates RSO sufficient authority, organizational  
freedom, and management prerogative.  Yes ( ) No

h. Appropriate review by Committee in accordance with 35.22(b).  
 Yes ( ) No

2. INSPECTION HISTORYViolations or deviations noted during last inspection conducted on May 1988 Yes ( ) No.Response letter dated July 11, 1988

(See Appendix B for details)

3. SCOPE OF PROGRAM

Briefly list medical procedures and their frequency.

bone scans - dailyiodine therapy: hospitalization req'd ~ 15 per yeariodine - other 2-3 per weekKe-132 - ~5 per month. No Tc-99m aerosolbrachytherapy - Cs-137, occ. use of I-125 seeds or I-192 seedsbone mineral analyzer4. INTERNAL AUDITS OR INSPECTIONS

a. Required by license condition. ( ) Yes (x) No ( ) N/A

b. Investigations or inspections conducted. (x) Yes ( ) No

[35.21(a) and (b)(2)]

Remarks.

c. Records maintained. (x) Yes ( ) No [35.21(b)(2)(xi)]

Remarks.

5. TRAINING, RETRAINING, AND INSTRUCTION TO WORKERS

a. License referenced training program.

(1) Training program implemented. (x) Yes ( ) No

Remarks.

(2) Retraining program implemented. (x) Yes ( ) No

Remarks.

## 5. (cont'd)

b. Instruction to workers in accordance with 10 CFR 19.12.

Yes ( ) No

Remarks.

\*c. Describe the QA program to mitigate therapeutic misadministrations.

(1) Have secondary checks of the dose calculations been done? *Not usually*  
( ) Yes ( ) No

(2) Do the second party checks of the dose calculations provide assurance that the final treatment plan will provide the dose prescribed on the patient chart? ( ) Yes ( ) No

(3) Do technologists consult with the doctor if the prescription or other orders are unclear? ( ) Yes ( ) No  
Remarks.

d. Followup on therapy or serious diagnostic misadministrations *None occurred*

(1) 10 CFR 35.43 properly implemented? ( ) Yes ( ) No

(2) Was proper medical care given for the patient pursuant to the NRC medical consultant recommendations? ( ) Yes ( ) No

(3) Were appropriate actions implemented to prevent recurrence?  
( ) Yes ( ) No

(4) Were the technologist and dosimetrist made aware of these actions?  
( ) Yes ( ) No

(5) Do the licensee's QA/QC procedures address these actions to prevent recurrence? ( ) Yes ( ) No  
Remarks.

*However, two misadministrations occurred using non-NRC regulated source/device. Investigation was performed and reported as required.*

6. RADIOLOGICAL PROTECTION PROCEDURES

a. Radiation Safety program changes reviewed. (Exception to changes without license amendment may be found in 35.13 and 35.606.)

Yes ( ) No

\*Inspect when QA rule becomes final.

6. (cont'd)

- b. Records of changes in procedures reviewed.  Yes ( ) No  
 [35.31(b)]  
 Remarks.

- c. Radioactive materials used in accordance with current procedures.  
 Yes ( ) No [35.21(b)(2)]  
 Remarks.

(1) Describe individuals understanding of current procedures.

*Very good.*

(2) Examples of key procedures:

- \* (a) ordering and accepting packages of RAM
- (b) general rules for safe use of RAM ✓
- (c) emergency procedures ✓
- \* (d) survey procedures ✓
- (e) handling of volatile RAM (e.g., Xe-133, I-131) ✓
- (f) precautions for use of RAM (sealed and unsealed) for therapy ✓
- (g) emergency procedures posted? *yes*
- (h) do licensee personnel understand emergency procedures? *yes*
- (i) safety procedures for patient therapy in accordance with 35.315 and 35.415 *yes*

7. MATERIALS, FACILITIES AND INSTRUMENTS

*\* Procedures performed by HP Office employees, not NMTs*

- a. Facilities as described in license application.  Yes ( ) No  
 Remarks.

- b. Isotope, chemical form, quantity and use as authorized.  
 Yes ( ) No [L/C]  
 Remarks.

- c. Syringes containing radioactive material properly labeled and shielded unless contraindicated.  Yes ( ) No [35.60(a)(b)(c)]

- d. Vials containing radioactive material properly labeled and shielded.  
 Yes ( ) No [35.61(a)(b)]

## 7. (cont'd)

## e. Tests required by regulations.

- (1) molybdenum-99 breakthrough.  Yes ( ) No [35.204(b)]  
 (2) performed as required.  Yes ( ) No [35.204(a)]  
 (3) records maintained.  Yes ( ) No [35.204(c)]  
 Remarks.

- \* (4) Leak tests.  Yes ( ) No \* Performed by HP Office techs  
 (5) Leak tests performed as required.  Yes ( ) No [35.59(b)]  
 Dates and Remarks.

## \* f. Inventory of sealed sources.

- (1) Inventory of Group VI sources.  Yes ( ) No [35.59(g)]  
 Dates:  
 (2) Inventory of calibration sources.  Yes ( ) No [35.59(g)]  
 Dates:

## g. Areas for storage and use of radioactive materials.

- (1) Method used to prevent an unauthorized individual *locks*  
 (2) Radioactive material secured to prevent unauthorized removal from an  
 unrestricted area.  Yes ( ) No [20.207]  
 Remarks.

- (3) Area wipe tested?  Yes ( ) No  
 Remarks.

## h. Instrumentation.

- (1) Operable survey instruments are as described or equivalent to those  
 described in license application.  Yes ( ) No  
 [35.120, 220, 320, 420]  
 Remarks.

7. (cont'd)

(2) Capability of radiation survey instruments is adequate for program.

 Yes ( ) No

Remarks.

(3) Calibration of survey instruments required.  Yes ( ) No(a) Performed as required.  Yes ( ) No [35.50]

Dates and Remarks.

(4) Records of calibration maintained for 2 years. [35.50(e)]

 Yes ( ) No*Not reviewed. All meters observed  
had current calibration status*8. RECEIPT AND TRANSFER OF RADIOACTIVE MATERIALReceipt of incoming packages during "off-duty" hours by whom? *HP Office*(a) Where stored? Security? [L/C] *locked bunker area*(b) Survey of incoming packages.  Yes ( ) No [20.205(b)(1)]

Remarks.

(1) Record of survey.  Yes ( ) No [20.401(b)]

Remarks.

(c) Procedure for opening packages.  Yes ( ) No [20.205(d)]

Remarks.

(d) Returned licensed material transferred in accordance with 10 CFR 30.41.

 Yes ( ) No

Remarks.

8. (cont'd)

(e) Records of receipt and transfer maintained.  Yes ( ) No

[30.51]

Remarks.

9. PERSONNEL RADIATION PROTECTION - EXTERNAL

(Obtain information regarding whole body and extremity monitors)

- a. Film or TLD badge supplier Arms Lexington KY Frequency monthly
- b. Reports reviewed by RSO? yes Others Tech Services, RCC  
 Frequency on receipt  
 (Are badges assigned to personnel as per licensee's correspondence with NRC?)
- c. NRC inspector reviewed personnel monitoring records for period Dec 1988  
 to October 1989
- d. NRC forms or equivalent.
- (1) NRC-4:  Yes ( ) No Complete: ( ) Yes ( ) No  
 Necessary  Yes ( ) No
- (2) NRC-5:  Yes ( ) No Complete: ( ) Yes ( ) No  
 [20.401(a)]  
 Remarks.
- e. Maximum ~~quarterly~~ whole-body exposure. 155 mrem typical M
- f. Maximum ~~quarterly~~ extremity exposure. 2.8 rem typical M
- g. Licensee has implemented an ALARA program.  Yes ( ) No  
 [35.50] [see Procedure No. 83822, "Radiation Protection"]  
 Remarks.
- h. Radiation survey of unrestricted areas.  Yes ( ) No  
 (20.201(b) to show compliance with 20.105(b)) [35.315(a)(4)];  
 [35.415(a)(4)]  
 Remarks.

## 9. (cont'd)

- (1) Record of surveys maintained.  Yes ( ) No  
 [20.401(b) to show compliance with 20.105(b)]  
 Remarks.

## i. Radiation survey of storage and use areas:

- (1) Quarterly survey brachytherapy source storage. ( ) Yes ( ) No *Not inspected*  
 [35.59(h)]
- (2) Temporary implant patient release survey.  Yes ( ) No  
 [35.404(a)]
- (3) Radiopharmaceutical and permanent implant patient release survey.  
 Yes ( ) No [35.75]
- (4) Radiopharmaceutical therapy room contamination survey.  
 Yes ( ) No [35.315(a)(5) and (7)]
- (5) Patient survey upon implant.  Yes ( ) No [35.406(c)]
- (6) Radiopharmaceutical storage and laboratory use areas.  
 Yes ( ) No [35.70]  
 Remarks.

- j. Record of survey maintained.  Yes ( ) No [35.70(h)]  
 Remarks.

- k. Inventory of brachytherapy sources after use.  Yes ( ) No  
 [35.406]  
 Remarks.

- l. Records maintained.  Yes ( ) No [35.59(g)]; [35.406]

- m. Dose calibrator calibration and checks performed as follows:  
 Constancy  Yes ( ) No Accuracy  Yes ( ) No  
 Linearity  Yes ( ) No Geometric dependence  Yes ( ) No  
 [35.50]

10. PERSONNEL RADIATION PROTECTION - INTERNAL

- a. Potential for exposure of individuals to airborne radioactive material exists.  Yes ( ) No

Remarks.

All iodine storage hoods monitored using charcoal filter system, pump on at 10 litres per minute. Three sample lines

- b. Monitoring for airborne radioactivity conducted.  Yes ( ) No [20.201(b) to show compliance with all sections of 20.103 and 35.90]

Remarks.

are tested in each hood: 1) breathing zone 2) room air and 3) effluent to hood vent

- (1) Records of monitoring maintained.  Yes ( ) No [20.401(b) or L/C]

Remarks.

- c. Bioassay program implemented as described in correspondence with NRC.  Yes ( ) No [35.315(a)(8)]

- d. Control of airborne radioactivity in accordance with 35.205.  Yes ( ) No

11. RADIOACTIVE EFFLUENT AND WASTE DISPOSAL

- a. Radioactivity in effluents to unrestricted areas.  Yes ( ) No

- b. Release in accordance with regulatory limits.  Yes ( ) No [20.106(a)]

Remarks.

See above.

- c. State solid waste disposal method.

- d. State liquid waste disposal method.

} storage for decay  
 - return to vendor (generator)  
 - waste broken

## 11. (cont'd)

- e. Disposal of solid and liquid waste in accordance with regulatory requirements (decay in storage).  Yes ( ) No [35.92(a)]

Remarks.

- (1) Records of disposal.  Yes ( ) No [35.92(b)]

Remarks.

- f. Survey of waste prior to disposal.  Yes ( ) No [20.201(b) to show compliance with 20.301 - 35.92(a)(2)]

Remarks.

- (1) Records of survey maintained.  Yes ( ) No [20.401(b)]

Remarks.

12. NOTIFICATIONS AND REPORTS

- a. Licensee in compliance with 10 CFR 19.13 (reports to individuals).

Yes ( ) No [19.13]

Remarks.

- b. Licensee in compliance with 10 CFR 20.405 (overexposures).

Yes ( ) No [20.405(a)]

Remarks.

*None. ALARA reviews conducted and reported.*

- c. Licensee in compliance with 10 CFR 20.403 (incidents).

Yes ( ) No [20.403]

Remarks.

*No "report req'd" prudent.  
Some minor spills, occasional  
individual exceeding ALARA I level*

## 12. (cont'd)

d. Licensee in compliance with 10 CFR 20.402 ( theft or loss).

 Yes ( ) No [20.402(a) or (b)]

Remarks.

*None.*e. Licensee in compliance with reporting therapeutic misadministrations and taking corrective action.  Yes ( ) No [35.33(a)(b)(d)]

Remarks.

*None.*

f. Licensee in compliance with reporting diagnostic misadministrations and taking corrective action as needed under conditions set forth in 10 CFR 35.33(c).

 Yes ( ) No

Remarks.

*None using NRC-regulated material  
One non-NRC radio pharmaceutical misadmin  
one accelerator therapeutic misadministration*13. POSTING OF NOTICESNotices to workers posted.  Yes ( ) No [19.11(a), (b), or (c)]

Remarks.

14. CONFIRMATORY MEASUREMENTSa. Measurements made by inspector.  Yes ( ) Nob. Survey instrument and probe Ludlum 14CNRC Serial No. 009669c. Describe type and results of measurements and compare with licensee's measurements. *Good agreement. See below*15. INDEPENDENT MEASUREMENTSa. Measurements made by inspector.  Yes ( ) Nob. Survey instrument See above

NRC Serial No. \_\_\_\_\_

c. Describe type and results of measurements.

*Rad waste, normal trash, unrestricted area.  
Such as hallway, offices. All OK.  
See p14 of RED field notes.*

16. POSTING AND LABELING

Posting and labeling in accordance with 10 CFR 20.203.

Yes ( ) No [20.203]

Remarks.

17. LICENSE CONDITIONS

a. All license conditions reviewed during inspection.  Yes ( ) No

b. Activities were conducted in accordance with license conditions, except as noted elsewhere in this report.  Yes ( ) No

Remarks:

18. BULLETINS AND INFORMATION NOTICES

a. Bulletins and Information Notices issued during current year.  
List:

*NI*

b. Bulletins and Information Notices received by licensee. ( ) Yes ( ) No  
Remarks.

*NI*

c. Licensee took appropriate action in response to Bulletins and Information Notices. ( ) Yes ( ) No

Remarks.

*NI*

19. TRANSPORTATION (10 CFR 71.5a and 49 CFR 171-178)

*See other field notes.*  
Yes      Violation?

a. License makes shipments of RAM?  
If "Yes", complete the following items.

     ( )

b. Such shipments consisted of:

- ( ) radwaste
- ( ) sources/products
- ( ) other \_\_\_\_\_

APPENDIX A - DOCUMENTATION OF NONCOMPLIANCE

Requirement	Basis for noncompliance
1. 10 CFR <u>20.</u> Lic Cond _____	<i>Refrigerators in unventilated hallways of WRAIR not locked.</i>
2. 10 CFR _____ Lic Cond _____	
3. 10 CFR _____ Lic Cond _____	
4. 10 CFR _____ Lic Cond _____	
5. 10 CFR _____ Lic Cond _____	
6. 10 CFR _____ Lic Cond _____	

APPENDIX B - LICENSEE ACTION ON PREVIOUS INSPECTION FINDINGS

Identification and summary of action taken

Status

Report No: 88-001

Severity Level IV

Describe previous violation:

An individual who had performed iodinations did not have thyroid ~~test~~ assay performed

Corrective Action taken:

Aggressive program to ID individuals who perform iodinations. Operations Branch maintains list of such individuals and

OPEN

CLOSED

Report No.:

Severity Level

~~Describe previous violation:~~

each week provides names of those who have done iodination that week. Tech Service calls the

~~Corrective Action taken:~~

individuals in for thyroid assay if they do not come in voluntarily. Records of assays are maintained. Names of individuals who had performed iodinations

OPEN

CLOSED

Report No.:

Severity Level

~~Describe previous violation:~~

or iodine therapies were selected at random for several dates. Records of thyroid assay

~~Corrective action taken:~~

were available for all selected individuals

OPEN

CLOSED

APPENDIX B (continued)

B

Identification and summary of action taken Status

Report No: 88-001 Severity Level V

Describe previous violation: *Records of package monitoring not maintained.*  
Corrective action taken: *Records now maintained. Records reviewed for 1989.* OPEN

CLOSED

Report No: \_\_\_\_\_ Severity Level \_\_\_\_\_

Describe previous violation:

Corrective action taken: OPEN

CLOSED

Report No: \_\_\_\_\_ Severity Level \_\_\_\_\_

Describe previous violation:

Corrective action taken: OPEN

CLOSED

APPENDIX C - SUPPLEMENTARY INFORMATION

---

( ) Unusual occurrence, conditions, etc.

(X) Unresolved items

( ) Description of attachments to field notes

(X) Inspector's comments

No review of the following areas was performed:

- 1) Training records for individuals
  - 2) Instrument calibration records
  - 3) Qualifications / RCC approval of  
authorized users for medical procedures
  - 4) Xe-133 use / procedures
-

APPENDIX B

NUCLEAR MEDICINE INSPECTION FIELD NOTES  
Region 1

Inspection Report No. 92-001

License No. 08-01738-02 / 08-01738-03

Licensee (name and address)

Docket No. 030-01317 / 030-06895

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

Licensee Contact \_\_\_\_\_ Telephone No. \_\_\_\_\_

Last Amendment No. 60 Date of Amendment 12-6-91

Priority: 1

Program Codes:

- 02110 - Broad Scope
- 02121 - Custom
- 02209 - In Vivo
- 02210 - Eye Applicator
- 02400 - Veterinary
- 02500 - Pharmacy
- 02120 - Limited
- 02200 - Private Practice - Limited
- 02201 - Private Practice - Custom
- 02220 - Nuclear Medical Van
- 02410 - In Vitro
- Other - 3520

Date of Last Inspection: 8-19-91

Date of This Inspection: 3-11, 12, 13, 14-92

Type of Inspection:

- Announced
- Routine
- Initial
- Unannounced
- Special
- Reinspection

Next Inspection Date: 8-93  Normal  Reduced  Extended

Summary of Findings and Action:

- No violations, Clear 591 or letter issued
- Violations, 591 or letter issued
- Action on Previous Violations

Inspector: Remy Nestor  
(Signature)

Date: 3-19-92

W. D. ...

8-19-92

Approved: M. S. ...  
(Signature)

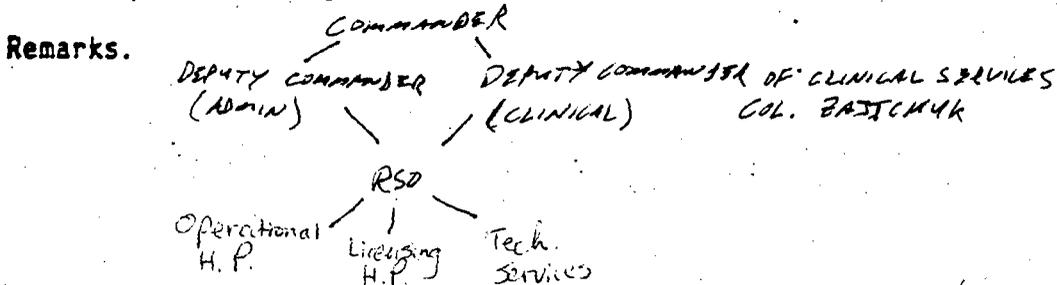
Date: 9/9/92

\* All areas indicated in field notes are not required to be addressed during each inspection.

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1. ORGANIZATION

a. Organizational structure meets license requirements [L/C]  Y  N



b. Use by authorized individuals [35.22(b)(2)]  Y  N

Remarks. Interim approvals given by RSD until RSC meets for non-human use protocols.  
 3 year renewal on all non-human use protocols.  
 1 year renewal on all human use protocols.  
 AU must submit a complete package to renew and RSC treats as a new protocol.

c. Radiation Safety Committee  N/A

- (1) Membership as specified in [35.22(a)(1)]  Y  N
- (2) Meetings held quarterly [35.22(a)(2)]  Y  N
- (3) Quorums established per [35.22(a)(3)]  Y  N
- (4) Has sufficient authority per [35.23]  Y  N
- (5) Committee reviews conducted per [35.22(b)]  Y  N
- (6) Record of Committee meetings [35.22(a)(4)]  Y  N

Remarks. 12-91 3-92 5-92  
 - Annual Audit Performed by the RSD from the Army HQ

d. Radiation Safety Officer

- (1) Appointed [35.21(a)]  Y  N
- (2) Fulfills duties per [35.21(b)]  Y  N
- (3) Has sufficient authority per [35.23]  Y  N

Remarks. LTC Samiljan

- e. Visiting Authorized User  N/A
- (1) Has written permission [35.27(a)(1)]  Y  N
  - (2) Copy of visitor's license on file [35.27(a)(2)]  Y  N
  - (3) Performs only those procedures authorized on visitor's license [35.27(a)(3)]  Y  N
  - (4) Uses material under licensee's license for sixty days per year or less [35.27(b)]  Y  N
  - (5) Records maintained 3 years after last visit [35.27(c)]  Y  N

Remarks.

- f. Mobile Nuclear Medicine Service  N/A
- (1) Licensee uses mobile nuclear medicine services [35.29]  Y  N
  - (2) Licensee operates mobile nuclear medicine services [35.29, 35.80]  Y  N

Remarks.

2. INSPECTION HISTORY  N/A - Initial inspection

- a. Last inspection conducted on 2-18-97
- b. Violations or deviations were identified  Y  N
- c. Response letter or 591 dated 3-21-97
- d. Violations from Previous Inspection

<u>Requirement</u>	<u>Violation</u>	<u>Corrective Action Taken (Y/N)</u>	<u>Status</u>

e. Any previous violations not corrected

~~( ) Y ( ) N~~ NA

Explain.

3. SCOPE OF PROGRAM

a. License has multiple authorized locations of use  Y  N

b. If so, list location(s) inspected  N/A

- \* WALTER REED Army MED CENTER, WASH. D.C.
- \* WRAMC FOREST GLEN, SILVER SPRING, MD
- \* KEY WEST RESEARCH CENTER, ROCKVILLE, MD
- \* RICKMAN BUILDING ROCKVILLE, M.D.

(U.S. Army MED. RESEARCH INSTITUTE FOR INFECTIOUS DISEASES in Frederick MD will have separate license)

c. List those individuals contacted during inspection

SEE ATTACHED

\*Indicates presence at exit meeting

d. Briefly describe scope, including types of use involving byproduct material, frequency of use, staff size, etc.

- HP staff ~ 21 members
- 2-3 brachy procedures / month
- 4 I-131 ~ 30000i therapy / month (I-192, Cs-137, I-125)
- No P-32 therapy
- receive (2) 9.2 Ci generators / wk
- Nuc med staff: one full-time radiopharmacist & 9 full-time techs.
  - ~ 40 studies / day
  - ~ 3 ~ 23000i I-131 therapy / month
- Blood irradiator on 4th floor of Hosp (S.C. Shepard Model 143 ~ 20000i Cs-137)
- GammaCell 220 AZCL Cobo & GammaCell 40 Cs-137 irradiators in basement of

80 authorizations active  
350 labs.

Radiopharmacy opens at 6 a.m., injections start at 7 a.m.

e. Radiation safety program changes pursuant to [35.31]

f. Records of changes maintained [35.31(b)]

Y  N  N/A WRAIR  
 Y  N  N/A

Remarks. ex. changed the color of bags for Rad waste disposal

4. INTERNAL AUDITS OR INSPECTIONS

a. Audits or inspections are conducted (X) Y ( ) N ( ) N/A

(1) Audits conducted by HEALTH PHYSICS STAFF

(2) Frequency: WEEKLY OR MONTHLY

b. Audits are required by license condition (X) Y ( ) N

c. Records maintained (X) Y ( ) N

Remarks. - NUCLEAR MED, RADIOIODINATION LABS AND OTHER LARGE LABS - WEEKLY  
- SMALLER LABS - MONTHLY

HA TECHS PERFORM SURVEYS AND GO OVER CHECKLIST OF ITEMS

5. TRAINING, RETRAINING, AND INSTRUCTIONS TO WORKERS

a. Instructions to workers per [10 CFR 19.12] (X) Y ( ) N

Remarks. NUC MED: CAPT. MURRAY (RADIOPHARMIST) REVIEWS PROCEDURES & REGS BEFORE USE  
RESEARCH LABS: MUST ATTEND A 2 DAY COURSE GIVEN BY HP STAFF BEFORE USE  
OTHER GROUPS: HOUSEKEEPING, FIREFIGHTERS & LAW ENFORCEMENT

b. Training program required [L/C] (X) Y ( ) N ( ) N/A

(1) Training program implemented (X) Y ( ) N

(2) Retraining program required (X) Y ( ) N

(3) Retraining program implemented (X) Y ( ) N

(4) Records maintained (X) Y ( ) N

Remarks. NUC MED: IN ~~SERVICE~~ <sup>SERVICE</sup> YEARLY BY HP STAFF / RADIOPHARMIST REVIEWS PARTS  
AND OTHERS REGS WITH STAFF YEARLY  
RESEARCH: AUTH. USGS RECEIVE YEARLY TRAINING FROM HP STAFF - THEY  
THEN GIVE IN-SERVICE TO MEMBERS OF THESE LABS

c. Supervision of individuals by authorized user in accordance with [35.25] (X) Y ( ) N

Remarks.

Authorizations are audited twice/year to ensure: 1) all personnel are trained; 2) AU has not violated authorization; and 3) inventory is precise and not over licensed limit.

6. FACILITIES AND EQUIPMENT

a. Facilities as described in license application  Y ( ) N

Remarks. *As mentioned in 3b. the facility at Frederick, MD will be on a separate license*

b. Areas for storage and use of RAM

- (1) Adequate method used to prevent an unauthorized individual from entering restricted area  Y ( ) N
- (2) RAM is secured to prevent unauthorized removal from an unrestricted area [20.207]  Y ( ) N

Remarks.

c. Dose calibrator

- (1) Licensee possesses and uses dose calibrator(s) per [35.50(a)]  Y ( ) N ( ) N/A
- Cs-137* (2) Constancy checked per [35.50(b)(1)]  Y ( ) N
- Co-57* (3) Linearity tested per [35.50(b)(2)]  Y ( ) N
- Co-57* (4) Accuracy tested per [35.50(b)(3)]  Y ( ) N
- Co-60* (5) Geometry dependence tested per [35.50(b)(4)]  Y ( ) N
- Ba-133* (6) Readings mathematically corrected if linearity error is greater than 10% [35.50(d)]  Y ( ) N
- Cs-137* (7) Records maintained [35.50(e)]  Y ( ) N
- (8) RSO signs linearity, accuracy and geometry dependence tests [35.50(e)]  Y ( ) N

Remarks. *CONSTANCY REVIEWED EACH MONDAY BY RADIOPHARMIST*

*- HAVE A BACK-UP DOSE CAL. - ACCURACY & LINEARITY ROUTINELY DONE FOR THIS D.C. - ~~CONSTANCY~~ DONE IF USED*

d. Survey instruments

- (1) Appropriate operable survey instruments possessed per [35.120,220,320,420] or available per [35.520]  Y ( ) N ( ) N/A
- (2) Calibration performed as required in [35.51]  Y ( ) N
- (3) Records maintained [35.51(d)]  Y ( ) N
- (4) Proper operation checked with check source per [35.51(c)]  Y ( ) N

Remarks.

Instruments calibrated by HPSI normally. Dept. of Army allowed contract to lapse, so for the last three ~~the~~ months, the TMDE (Military Calib. Facility) has calibrated instruments until a new contract w/ HPSI can be formalized.

- e. Syringes containing RAM properly labeled and shielded unless contraindicated per [35.60]  Y ( ) N
- f. Vials containing RAM properly labeled and shielded per [35.61]  Y ( ) N

Remarks.- INSPECTOR OBSERVED A TECH PREPARING AND INSERTING A DOSE - RADIO PHARMICIST CHECKS DOSES BEFORE STUDENTS ADMINISTER DOSE

7. RADIOLOGICAL PROTECTION PROCEDURES

- a. Radioactive materials used in accordance with current procedures [L/C]  Y ( ) N

Remarks.

b. Individuals' understanding of current procedures is adequate

- (1) in general rules for safe use of RAM
- (2) in emergency procedures

Y ( ) N  
 Y ( ) N

Remarks.

8. MATERIALS

a. Licensee uses unit doses

Y ( ) N

b. Licensee uses generators *2 generators (w/ 1920)*

Y ( ) N

c. Licensee possesses sealed sources or brachytherapy sources per [35.59]

Y ( ) N

d. Isotope, chemical form, quantity and use as authorized [L/C, 31.11, 35.100, 200, 300, 400, 500]

Y ( ) N

Remarks.

Licensee has set up all authorizations to ensure that if each AU possessed all the material they were authorized, the licensee would still be at only about 50% of their NRC limits. From *2nd* yr '92 inventory, licensee is below licensed limits.

e. Molybdenum-99 breakthrough

( ) N/A

(1) Test performed per [35.204(b)]

Y ( ) N

(2) Records maintained per [35.204(c)]

Y ( ) N

Remarks.

f. Leak tests and Inventory

- |   |   |
|---|---|
| (1) Leak tests performed on sealed sources and brachytherapy sources per [35.59(b)] | <input checked="" type="checkbox"/> Y ( ) N |
| (2) Inventory of sealed sources and brachytherapy sources per [35.59(g)]            | <input checked="" type="checkbox"/> Y ( ) N |
| (3) Leak tests records in microcuries   | <input checked="" type="checkbox"/> Y ( ) N |
| (4) Leak test/inventory records signed by RSO                                       | <input checked="" type="checkbox"/> Y ( ) N |
| (5) Records maintained of leak tests and inventories for 5 years                    | <input checked="" type="checkbox"/> Y ( ) N |

Remarks.

9. RECEIPT AND TRANSFER OF RADIOACTIVE MATERIAL

- a. Describe how packages are received and by whom: ( ) N/A

*Nuc. Med: Carrier uses combo lock to enter storage area which contains a lead cabinet into which the generators are placed. The storage area is protected and locked at all times*

*Packages for research are delivered by courier to the Rad. Safety Office where a Rad. Safety Tech checks them in.*

- |   |   |
|---|---|
| b. Opening procedures established and followed [20.205(d)]                      | <input checked="" type="checkbox"/> Y ( ) N |
| c. Incoming packages wiped per [20.205(b)]                                      | <input checked="" type="checkbox"/> Y ( ) N |
| d. Incoming packages surveyed per [20.205(c)]                                   | <input checked="" type="checkbox"/> Y ( ) N |
| e. Transfer(s) performed per [30.41]  | <input checked="" type="checkbox"/> Y ( ) N |
| f. Records of surveys and receipt/transfer maintained per [20.401(b) and 30.51] | <input checked="" type="checkbox"/> Y ( ) N |

Remarks. *Nuc.med: all <sup>incoming</sup> packages (inner & outer) wipe tested*  
*All research packages are wipe tested and surveyed.*

10. AREA SURVEYS

( ) N/A

- a. Ambient exposure rate surveys conducted per [35.70(a),(b),(c)]  Y ( ) N
- b. Contamination surveys conducted per [35.70(e),(f)]  Y ( ) N
- c. Trigger levels established [35.70(d), (g)]  Y ( ) N
- d. Exposure rate survey records in mR/hr  Y ( ) N
- e. Contamination survey records in dpm/100 cm<sup>2</sup>  Y ( ) N
- f. Records maintained per [35.70(h)]  Y ( ) N

Remarks: - NUC. MED. RECORDS ARE REVIEWED EACH MONDAY BY RADIOPHARMIST

- MOST WIPES COUNTED IN A LSC & GAMMA COUNTER

LIMITS:

- > 500 dpm/100cm<sup>2</sup> - notify lab and re-survey within 72 hours
- > 200 dpm/100cm<sup>2</sup> - notify lab and check at next audit

11. RADIOPHARMACEUTICAL THERAPY

( ) N/A

- a. Licensee provides safety instruction [35.310] and implements safety precautions [35.315] or equivalents [L/C]  Y ( ) N
- b. Patient room contamination surveys per [35.315]  Y ( ) N
- c. Release of patients containing radiopharmaceuticals meets [35.75]  Y ( ) N
- d. Thyroid burden measured on individuals involved in dose administrations [35.315(a)(8)]  Y ( ) N
- e. Records maintained  Y ( ) N

N/C

Remarks: NM Physicians not always bioassayed after therapies.

wards 67 and 74 used for all therapies. Licensee cleans room to <math>220 \text{ dpm/100cm}^2</math> Licensee currently has an amendment in house to request an exemption from decontaminating therapy rooms since they are dedicated rooms. The next inspector should verify how contamination surveys are handled once the amendment is acted upon.

N/C

Licensee performs 2 exposure surveys once patient is closed: 1) w/ patient behind shield and measuring exposure rates of adjacent rooms 2) w/ patient and in hallway at doorway and measuring exposure rates at doorway. All exposure rates by method 2 were <math>2 \text{ mR/hr}</math> and licensee did not restrict access to hallway.

12. BRACHYTHERAPY

( ) N/A

- a. Licensee provides safety instruction [35.410] and implements safety precautions [35.415] or equivalent [L/C]  Y ( ) N
- b. Patient surveys performed per [35.406]  Y ( ) N
- c. Release of patients containing permanent implants meets [35.75] N/A  Y ( ) N
- d. Release of patients treated with temporary implants meets [35.404]  Y ( ) N

- e. Brachytherapy sour. inventoried per [35.406]  Y ( ) N
- f. Brachytherapy source storage area surveyed quarterly and record signed by RSO [35.59(h)]  Y ( ) N
- g. Records maintained  Y ( ) N

*N/C* On 11-19-91 and 4-17-92, temporary implants were explanted and the survey of the patient was performed, but no record was maintained. Brachy source storage area surveyed weekly. Bedside shields available and used to reduce exposure. On weekends, if sources are explanted, the physician & H.P. Tech take the sources down in a leaded carrier and leave the sources in the carrier until Monday. The physician fills out a log indicating what sources were returned. The H.P. Tech verifies that all sources were returned. The dosimetrist puts the sources back into the safe on Monday morning and re-verifies the inventory.

**13. PERSONNEL RADIATION PROTECTION - EXTERNAL**

- a. Film or TLD supplier Ionizing Rad. Det. Center Frequency monthly/quarterly  
*Lexington, Ky.*
- b. Supplier is NYLAP - approved  Y ( ) N
- c. Reports reviewed by REO Frequency monthly
- d. NRC inspector reviewed personnel monitoring records for period April 1991 to June 1992
- e. NRC forms or equivalent
 

(1) NRC-4:	<input checked="" type="checkbox"/> Y ( ) N	Complete:	<input checked="" type="checkbox"/> Y ( ) N ( ) N/A
(2) NRC-5:	<input checked="" type="checkbox"/> Y ( ) N	Complete:	<input checked="" type="checkbox"/> Y ( ) N ( ) N/A

*2 month turn around time for badges.*

- f. List maximum exposures (millirem):
- g. Licensee has implemented an ALARA program [35.20] *WB: 139 mR/month; 154 mrem/yr* Ring *1380 mrem/month; 2910 mrem/yr.*  
 Y ( ) N

**Remarks.**

Investigation at ALARA I  
 NU Tech received 2.5 rem WB shallow and 2.5 rem extremity and 0 rem WB deep. NU Tech is not involved w/ any beta sources but licensee could not explain close away, so added to lifetime exposure.  
 If badge is not returned, licensee sends user a letter requesting badge. If badge not returned in 3 months, an administrative fee is assigned.

**14. PERSONNEL RADIATION PROTECTION - INTERNAL**

- a. Potential for exposure of individuals to airborne RAH exists *I-131, I-125, Xe-133*  Y ( ) N
- b. Monitoring for airborne radioactivity conducted [20.201(b) to meet 20.103, 35.90, and 35.205]  Y ( ) N

*Breathing zone, effluent, and in room filters for all iodine levels*

- c. Records maintained [20.401, 35.205(d), and L/C]  Y ( ) N
- d. Bioassay program implemented as described in correspondence with NRC  Y ( ) N
- e. Radioactive gases

- (1) Clearance time and safety procedures are posted [35.205(d)]  Y ( ) N
- (2) Reusable collection systems checked monthly  Y ( ) N
- (3) Ventilation rates checked each six months for negative pressure [35.205(e)]  Y ( ) N

3-92

Remarks. Vent check had not been done previously but was pointed out during the last annual audit and was corrected.

Licensee investigates all I-131 uptakes of greater than 6 nCi and all I-125 uptakes of greater than 40 nCi.

**15. RADIOACTIVE EFFLUENT AND WASTE DISPOSAL**

- a. RAM in effluents to unrestricted areas  Y ( ) N
- b. Release in accordance with regulatory limits [20.106(a)]  Y ( ) N

Remarks.

- c. Describe waste disposal method(s) - solid and liquid:
  - DECAY IN STORAGE (T ± L 90d) - Waste Facility in old reactor
  - SKIP THROUGH CHEMICAL TO WASTE BURIAL FACILITY
  - SEWER DISPOSAL

2 vial crushers, 1 Trash compactor w/ ~ 4-1 compaction.

- d. If LLW is stored because access to a burial site has been denied, answer (1), (2), and (3) below:
  - (1) Adequate control of waste in storage is maintained  Y ( ) N
  - (2) Package is labeled and package integrity is adequately maintained  Y ( ) N
  - (3) Adequate records of surveys and material accountability are maintained  Y ( ) N

NA

- e. Disposal of waste in accordance with regulatory requirements [20.301 and 35.92]  Y ( ) N
- f. Decay-in-storage waste disposed per [35.92]  Y ( ) N
- g. Records maintained [20.401(b) and 35.92(b)]  Y ( ) N

Remarks. For 1991:  
 37 Drums sent to Chem Nuclear  
 SEWER: 342 mCi H-3 / 2.2 mCi C-14 / 212 mCi all others

16. NOTIFICATION AND REPORTS

- a. Licensee in compliance with [19.13]  
(reports to individuals) when requested by worker:  Y ( ) N ( ) N/A
- b. Licensee in compliance with [20.402]  
(theft or loss) ( ) Y ( ) N  None
- c. Licensee in compliance with [20.403]  
(incidents) ( ) Y ( ) N  None
- d. Licensee in compliance with [20.405]  
(overexposures) ( ) Y ( ) N  None

Remarks.

A gas chromatograph with 15 ml. Hi-83 was inadvertently disposed of at an Army waste disposal facility. The GC had a RAM sticker which stated that it was not to be disposed of without RSO approval. Evidently, no person saw this sticker and the GC was taken out and disposed of with the source in it and without the RSO knowing about it. When the mistake was discovered it was too late for recovery. They contacted the NRC Region I and were told it was not reportable under 20.402.

17. MISADMINISTRATIONS

- a. Misadministrations have occurred ( ) Y  N
  - (1) Diagnostic ( ) Y  N
  - (2) Therapeutic ( ) Y  N
- b. Licensee in compliance with reporting therapeutic misadministrations [35.33(a),(b)] ( ) Y ( ) N
- c. Licensee in compliance with reporting diagnostic misadministrations, if required [35.33(c)] ( ) Y ( ) N
- d. Appropriate action taken to prevent recurrence ( ) Y ( ) N
- e. Records maintained [35.33(d)] ( ) Y ( ) N

Remarks.

18. POSTING AND LABELING

- a. NRC-3 "Notice to Workers" posted  Y  N  
 b. Other posting and labeling per [20.203]  Y  N

Remarks.

19. TRANSPORTATION (10 CFR 71.5(a) and 49 CFR 171-189)

- a. Licensee makes shipments of RAM  Y  N  
 b. If so, describe shipment content and method:  
 \* Ship dispose of waste through ChemPaction  
 \* Return generators ~~within~~ <sup>after</sup> two weeks to Manufacturer  
 \* Return Fr-192 ribbon to manufacturer after use  
 Licensee has a dedicated, placarded vehicle for delivering RAM and picking up waste.  
 c. Licensee is aware of 10 CFR 61 requirements  Y  N  N/A  
 d. Licensee classifies and characterizes waste  Y  N  N/A  
 e. Shipments  
 (1) Authorized packages used [173.415, 416]  Y  N  N/A  
 (2) Package type used 7A & 17H  
 (3) For DOT-7A packages, performance test record on file [173.415(a)] NI  Y  N  N/A  
 (4) For special form sources, performance test record on file [173.476(a)] NI  Y  N  N/A  
 (5) Packages properly labeled [172.403, 173.441]  Y  N  N/A  
 (6) Packages properly marked [173.200]  Y  N  N/A  
 (7) Proper shipping papers prepared and used [172.200-204]  Y  N  N/A

Remarks.

Manufacturer sends a kit with instructions for generators & Fr-192 ribbon for return shipment.

f. Licensee makes return shipments of radiopharmacy doses

( ) Y ( ) N (✓) N/A

(1) If YES, licensee assumes responsibility of all shipper requirements

( ) Y ( ) N

(2) If NO, describe arrangements made between licensee and radiopharmacy as to performance of shipper responsibilities:

20. RECORDKEEPING FOR DECOMMISSIONING

a. Records of information important to the safe and effective decommissioning of the facility maintained in an independent and identifiable location until license termination [30.35(g)]

(✓) Y ( ) N

b. Records include all information outlined in [30.35(g)]

(✓) Y ( ) N

Remarks.

21. INDEPENDENT MEASUREMENTS

*33505 Ludlum 14C NaI*

a. Survey instrument used \_\_\_\_\_

b. NRC Serial No. \_\_\_\_\_

c. Last date of calibration *4-27-91*

d. Inspector's measurements were compared to licensee's

(✓) Y ( ) N

e. Describe the type and results of measurements:

- Bench & work areas in the radiopharmacy had exp. levels well below regulatory limits
- In-house brachy patient room survey at door was 0.1 mR/hr (possibly shields were being used)
- Brachy source storage area: 0.8 mR/hr
- 425,000 cpm w/ NaI probe at waste storage area near I-25

22. BULLETINS AND INFORMATION NOTICES

NI

- a. Bulletins, Information Notices, etc., received by the licensee ( ) Y ( ) N
- b. Licensee took appropriate action in response to Bulletins, INs, etc. ( ) Y ( ) N

Remarks.

23. CONTINUATION OF REPORT ITEMS - USE BACK OF PAGE IF NECESSARY

Licensee possesses a Packard Scintillation Counter, a Canberra Auto-gamma counter, and an alpha-beta counter to assay all swipes and samples. These instruments have full service performed on them every 6 months by the manufacturer.

24. LIST OF VIOLATIONS

- 20.201 (b) Inadequate survey in that licensee did not show ~~that~~ compliance w/ 20.105 (b) which limits radiation levels in unrestricted areas.
- 35.315 (a)(8) NM Physicians not bioassayed after 9-13-91, 9-25-91, 11-25-91, 12-6-91, 4-23-92, and 6-2-92 iodine therapies.
- 35.404 (b) No record maintained of patient surveys after temporary brachytherapy explants on 11-19-91 and 4-17-92.

25. PERFORMANCE EVALUATION FACTORS

Licensee (name & location) Dept. of Army - Walter Reed Med. Center  
Washington, D.C. 20327

Inspector DAVIDSON & NEESSEN  
Inspection Date 8-11, 12, 13, 14-92

- a. Lack of senior management involvement with the radiation safety program and/or Radiation Safety Officer (RSO) oversight ( ) Y (  ) N
- b. RSO too busy with other assignments ( ) Y (  ) N
- c. Insufficient staffing ( ) Y (  ) N
- d. Radiation Safety Committee fails to meet or functions inadequately ( ) Y (  ) N
- e. Inadequate consulting services or inadequate audits ( ) Y (  ) N

Remarks (consider above assessment and/or other pertinent PEFs):

Regional follow-up on above PEFs citations:

Continue over normal inspection frequency.

3c. Individuals contacted:

\*Col. Francis O'Donnell - Deputy for Preventive Medical Services  
\*LTC Arthur Samiljan - Radiation Protection Officer (RSO on license)  
CPT Henry Synder, Branch Chief, Tech Services Branch  
David Burton - Branch Chief, Radiation Materials Control Branch  
SFC Mark Rook - Health Physicist  
Col. Jay Anderson - Chief, Nuclear Medicine Clinic  
SSG Michael Williamson - Radiation Safety Technician  
Simon Bautisa - Senior N.M. tech  
Angel Chevas - N.M. tech  
CPT Raymond Murry - Radiopharmacist  
Debra Holton - nurse  
Nancy Saxson - nurse  
Dr. Vahey - Authorized User  
Dr. Burx - Authorized User  
Dr. Hansen - Authorized User  
Irene Gist - Authorized User  
Dr. Billy Bass - Authorized User  
CPT Milanson - Branch Chief, Operations Branch  
SFC Green - Radiation Safety Technician  
SSG Lea Gaha - Radiation Safety Technician

3d. Nuclear Medicine:

- 6 rooms
- 9 cameras
- starting time 6 a.m.
- bulk liquid I-131 stored in hood and vented before administration
- mini hood inside larger hood for working with I-131
- Xe-133 unit doses uses - normally use a Pulmonex vent system but at the time of the inspection it was being repaired. A RadX system was being used in its place.
- approximately 2 Xe-133 patients/week
- a computerized management system is being used. The licensee wants to enlarge it so that all N.M. records can be stored on the computer system

RIA:

- normally less than 200 uCi on hand at one time
- 2 full-time staff members
- daily surveys with a pancake probe
- waste picked up every 2-3 weeks by HP staff

15c. Radioactive waste is stored in building 16. The licensee feels that there is plenty of room for storage if future problems of burial site access arise. The waste is compacted at building 16. A dedicated vehicle for transporting waste is used to pick up waste at each site and deliver to building 16. Waste is picked up weekly by the HP staff.

NUCLEAR MEDICINE INSPECTION FIELD NOTES\*

Region I

Inspection Report No. 93-001

License No. 08-01738-02, 03

Licensee (Name and Address):

Docket No. 030-01317 / 030-06895

Department of the Army  
Walter Reed Med. Ctr.

washington, DC

Licensee Contact: Col. Arthur G. Samiljan

Telephone No. 301-427-5104

Last Amendment No.

Date of Amendment

Priority: 1!!

Program Code:

- 02110 - Broad Scope
- 02120 - Limited
- 02121 - Custom
- 02200 - Private Practice - Limited
- 02209 - In Vivo
- 02201 - Private Practice - Custom
- 02210 - Eye Applicator
- 02220 - Nuclear Medical Van
- 02230 - HDR
- 02410 - In Vitro
- 02400 - Veterinary
- Other -

Date of Last Inspection 8/11-14 1992

Date of This Inspection 7/20 - 8/4/93

Type of Inspection:

- Announced
- Unannounced
- Routine
- Special
- Initial
- Reinspection

Next Inspection Date 08/94  Normal  Reduced  Extended

Summary of Findings and Action:

- No violations, Clear 591 or letter issued
- Violations, 591 or letter issued
- Action on Previous Violations

Inspector: Yeres Hall Darden (Signature)

Date: 7/31/93

Approved: James J. Khan (Signature)

Date: 8/1/93

\*All areas indicated in field notes are not required to be addressed during each inspection.

Z/ldo

I. ORGANIZATION

a. Organizational structure meets license requirements (L/C)  Y ( ) N

Remarks: .....  
.....  
.....

Represented ASO's from WRAIR (   
WRAMA   
AFIP

b. Use by authorized individuals [35.22(b)(2)]  Y ( ) N

Remarks: .....  
.....  
.....

c. Radiation Safety Committee ( ) N/A

- (1) Membership as specified in [35.22(a)(1)]  Y ( ) N
- (2) Meetings held quarterly [35.22(a)(2)]  Y ( ) N
- (3) Quorums established per [35.22(a)(3)]  Y ( ) N
- (4) Has sufficient authority per [35.23]  Y ( ) N
- (5) Committee reviews conducted per [35.22(b)]  Y ( ) N
- (6) Record of Committee meetings [35.22(a)(4)]  Y ( ) N

Remarks: <sup>meetings:</sup> 7/21/92  
12/13/92  
3/8/93  
6/12/93

d. Radiation Safety Officer

- (1) Appointed [35.21(a)]  Y ( ) N
- (2) Fulfills duties per [35.21(b)]  Y ( ) N
- (3) Has sufficient authority per [35.23]  Y ( ) N

Remarks: .....  
.....  
.....

e. Visiting authorized user

N/A

- (1) Has written permission [35.27(a)(1)]  Y  N
- (2) Copy of visitor's license on file [35.27(a)(2)]  Y  N
- (3) Performs only those procedures authorized on visitor's license [35.27(a)(3)]  Y  N
- (4) Uses material under licensee's license for sixty days per year or less [(35.27(b))]  Y  N
- (5) Records maintained 3 years after last visit [35.27(c)]  Y  N

Remarks: .....

f. Mobile Nuclear Medicine Service

N/A

- (1) Licensee uses mobile nuclear medicine services [35.29]  Y  N
- (2) Licensee operates mobile nuclear medicine services [35.29,35.80]  Y  N

Remarks: .....

2. Inspection History

N/A - Initial Inspection

- a. Last inspection conducted on 8/11-14/92
- b. Violations or deviations were identified  Y  N
- c. Response letter or 591 dated 12/1/92
- d. Violations from Previous Inspection:

<u>Requirement</u>	<u>Violation</u>	<u>Corrective Action Taken (Y/N)</u>	<u>Status</u>
15 C.F.R. 20.201 / 20.105	Failure to verify levels in unrestricted hallway	Yes	C
35.315(a)(8)	Failure to measure thyroid level	Yes	C

e. Any previous violations not corrected  Y  N

Explain: All records for bioassays were not immediately available at time of inspection. 8/24/93 telephoned conversation between LSO & inspector revealed that the person thought to have been present at time of I-131 administration and/or cleanup was coordinator of cleanup project and was not actively involved in actual I-131 activity.

3. SCOPE OF PROGRAM

a. Licensee has multiple authorized locations of use  Y  N

b. If so, list location(s) inspected  N/A

WRM - Georgia Ave, DC -> Med + Research  
Keys - Rockville } Research  
EM - Rockville }

c. List those individuals contacted during inspection:

Watkins, Nuc. Pharmacist  
Lt. Col. Arthur Samilian, RSD  
Yvette Sayer, NMT  
Sgt. Tim Dantz, Student  
Pat Ferguson, RIA  
Col. Francis O'Donnell, Dept of Army, Pres. Vol. Service  
Dr. Yvonne M. Andjeski, Maj. Rad. Oncol  
Sgt. Green

\*Indicates presence at exit meeting

d. Briefly describe scope, including types of use involving byproduct material, frequency of use, staff size etc.

NM = 35,100, 35,200, 35,300, Acceleration -> In 111  
Research - Usuals - H<sup>3</sup>, C<sup>14</sup>, Cr, S<sup>35</sup>

e. Radiation safety changes pursuant to [35.31]  Y  N  N/A

f. Records of changes maintained [35.31(b)]  Y  N  N/A

Remarks:

4. INTERNAL AUDITS OR INSPECTIONS

a. Audits or inspections are conducted

Y  N  N/A

(1) Audits conducted by Consultant RSO, H.P.

(2) Frequency Annually

b. Audits are required by license condition

Y  N

c. Records maintained

Y  N

Remarks .....

5. TRAINING, RETRAINING, AND INSTRUCTIONS TO WORKERS

a. Instructions to workers per [10 CFR 19.12]

Y  N

Remarks .....

b. Training program required [L/C]

Y  N  N/A

- (1) Training program implemented
- (2) Retraining program required
- (3) Retraining program implemented
- (4) Records maintained

Y  N  
 Y  N  
 Y  N  
 Y  N

Remarks .....

c. Supervision of individuals by authorized user in accordance with [35.25]

Y  N

Remarks .....

6. FACILITIES AND EQUIPMENT

a. Facilities as described in license application

Y ( ) N

Remarks One facility is presently being decommissioned (Rickman Bldg). Premature license amendment was submitted to R.I. to release bldg. Inspector explained that the results of the decon must be submitted to NRC for evaluation prior to release of bldg & the NRC must actually grant the release for unrestricted use

b. Areas for storage and use of RAM

- (1) Adequate method used to prevent an unauthorized individual from entering restricted area
- (2) RAM is secured to prevent unauthorized removal from an unrestricted area [20.207]

see comment on this  
 Y ( ) N ?  
 Y ( ) N

Remarks ~~Concern~~ <sup>Concern</sup> Tatt Research facility - Attempt is made to secure the front of the Bldg. However, back entry (from office side) immediately adjacent to the front closed door can be entered un hindered & unchallenged. Inspector was accompanied by RSO and spoke to Dept. Head about potential problem. RSO & Dept agreed to remove this

c. Dose Calibrator

( ) N/A

- (1) Licensee possesses and uses dose calibrator(s) per [35.50(a)]
- (2) Constancy checked per [35.50(b)(1)]
- (3) Linearity tested per [35.50(b)(2)]
- (4) Accuracy tested per [35.50(b)(3)]
- (5) Geometry dependence tested per [35.50(b)(4)]
- (6) Readings mathematically corrected if linearity error is greater than 10% per [35.50(d)]
- (7) Records maintained [35.50(e)]
- (8) RSO signs linearity, accuracy and geometry dependence tests [35.50(e)]

Y ( ) N  
 Y ( ) N  
 Y ( ) N  
 Y ( ) N  
 Y ( ) N  
 Y ( ) N  
 Y ( ) N  
 Y ( ) N

Remarks

d. Survey instruments

( ) N/A

- (1) Appropriate operable survey instruments possessed per [35.120, 220, 320, 420] or available per [35.520]
- (2) Calibration performed as required by [35.51]
- (3) Records maintained [35.51(d)]
- (4) Proper operation checked with check source per [35.51(c)]

Y ( ) N  
 Y ( ) N  
 Y ( ) N  
 Y ( ) N

Remarks .....

e. Syringes containing RAM properly labeled and shielded unless contraindicated per [35.60]

Y ( ) N

f. Vials containing RAM properly labeled and shielded per [35.61]

Y ( ) N

Remarks ~~.....~~ .....

7. RADIOLOGICAL PROTECTION PROCEDURES

a. Radioactive material used in accordance with current procedures [L/C]

Y ( ) N

Remarks .....

b. Individuals' understanding of current procedures is adequate

- (1) in general rules for safe use of RAM
- (2) in emergency procedures

Y ( ) N  
 Y ( ) N

Remarks .....

8. MATERIALS

- a. Licensee uses unit doses  Y  N
- b. Licensee uses generators  Y  N
- c. Licensee possesses sealed sources or brachytherapy sources per [35.59]  Y  N
- d. Isotope, chemical form, quantity and use as authorized [L/C, 31.11, 35.100, 200, 300, 400, 500]  Y  N

Remarks .....

.....

.....

.....

- e. Molybdenum-99 breakthrough  N/A
  - (1) Test performed per [35.204(b)]  Y  N
  - (2) Records maintained per [35.204(c)]  Y  N

Remarks .....

.....

.....

- f. Leak tests and Inventory
  - (1) Leak tests performed on sealed sources and brachytherapy sources per [35.59(b)]  Y  N
  - (2) Inventory of sealed sources and brachytherapy sources per [35.59(g)]  Y  N
  - (3) Leak tests records in microcuries  Y  N
  - (4) Leak test/inventory records signed by RSO  Y  N
  - (5) Records of leak tests and inventories maintained for 5 years  Y  N

Remarks .....

.....

.....

.....

9. RECEIPT AND TRANSFER OF RADIOACTIVE MATERIAL

a. Describe how packages are received and by whom: ( ) N/A

*Nuc. Med. - Receiver own*  
*Health Physics receives Researcher's materials*

b. Opening procedures established and followed per [20.205(d)]  Y ( ) N

c. Incoming packages wiped per [20.205(b)]  Y ( ) N

d. Incoming packages surveyed per [20.205(c)]  Y ( ) N

e. Transfer(s) performed per [30.41]  Y ( ) N

f. Records of surveys and receipt/transfer maintained per [20.401(b) and 30.51]  Y ( ) N

Remarks *Transfers are for <sup>licensee's</sup> aut. ~~transfer~~ used & used dedicated vehicle*

10. AREA SURVEYS ( ) N/A

a. Ambient exposure rate surveys conducted per [35.70(a),(b),(c)]  Y ( ) N

b. Contamination surveys conducted per [35.70(e),(f)]  Y ( ) N

c. Trigger levels established [35.70(d),(g)]  Y ( ) N

d. Exposure rate survey records in mR/hr  Y ( ) N

e. Contamination survey records in dpm/100 cm<sup>2</sup>  Y ( ) N

f. Records maintained per [35.70(h)]  Y ( ) N

Remarks

11. RADIOPHARMACEUTICAL THERAPY ( ) N/A

a. Licensee provides safety instruction per [35.310] and implements safety precautions [35.315] or equivalent [L/C]  Y ( ) N

b. Patient room contamination surveys per [35.315]  Y ( ) N

c. Release of patients containing radiopharmaceuticals meets [35.75]  Y ( ) N

d. Thyroid burden measured on individuals involved in dose administrations [35.315(a)(8)]

e. Records maintained

Y ( ) N  
 Y ( ) N

Remarks *Thyroid burdens are measured on all persons assisting with administrations & clean up of rooms. Most records located for all involved except one individual who has moved on to another military lease. RSO promised to contact individual & get back to inspector. He expects for dedicated room to remain locked until for decay until clean.*

12. BRACHYTHERAPY up prior to ~~treat~~ next patient treatment ) NIA

a. Licensee provides safety instruction [35.410] and implements safety precautions [35.415] or equivalent [LIC]

Y ( ) N

b. Patient surveys performed per [35.406]

Y ( ) N

c. Release of patients containing permanent implants meets [35.75]

Y ( ) N

d. Release of patients treated with temporary implants meets [35.404]

Y ( ) N

e. Brachytherapy sources inventoried per [35.406]

Y ( ) N

f. Brachytherapy source storage area surveyed quarterly and record signed by RSO [35.59(h)]

Y ( ) N

g. Records maintained

Y ( ) N

Remarks

13. PERSONNEL RADIATION PROTECTION - EXTERNAL

a. Film or TLD supplier *Army Ionizing Radiation Dosimetry Center* Frequency *monthly*

b. Supplier is NVLAP - approved  Y ( ) N

c. Reports reviewed by *RSO* Frequency *Quarterly*

d. NRC inspector reviewed personnel monitoring records for period *June 1992* to *May 1993*

e. NRC forms or equivalent

(1) NRC - 4 ( ) Y ( ) N Complete ( ) Y ( ) N

(2) NRC - 5 ( ) Y ( ) N Complete ( ) Y ( ) N

f. List maximum exposures (millirems):

(1) Whole Body  $\leq$  ALARA 2 limits (2) Extremity  $\leq$  ALARA 2 limits

g. Licensee has implemented an ALARA program [35.20]

Y ( ) N

Remarks .....

14. PERSONNEL RADIATION PROTECTION - INTERNAL

( ) N/A

- a. Potential for exposure of individuals to airborne RAM exists
- b. Monitoring for airborne radioactivity conducted per 20.201(b) to meet [20.103, 35.90 and 35.205]
- c. Records maintained [20.401, 35.205, and L/C]
- d. Bioassay program implemented as described in correspondence with NRC

Y ( ) N

Y ( ) N

Y ( ) N

Y ( ) N

Remarks .....

e. Radioactive gases

- (1) Clearance time and safety procedures are posted [35.205(d)]
- (2) Reusable collection systems checked monthly
- (3) Ventilation rates checked each six months for negative pressure [35.205(e)]

Y ( ) N

Y ( ) N

( ) Y ( ) N

Remarks .....

15. RADIOACTIVE EFFLUENT AND WASTE DISPOSAL

a. RAM in effluents to unrestricted areas

( ) Y ( ) N

b. Release in accordance with regulatory limits [20.105(a)]

Y ( ) N

Remarks

*Some Drains Disposal*

*Hoods are maintained & filters are clean*

c. Describe waste disposal method(s)- solid and liquid:

*Use Quadrex & Chem Nuclear*

Remarks

<i>5/26/93</i>	<i>7 Drum</i>	} <i>Presently waste that is generated in MD can be shipped to SC (Bannwell) but waste generated in DC is held in storage</i>
<i>2/24/93</i>	<i>5 "</i>	
<i>12/2/92</i>	<i>49 "</i>	
<i>8/12/92</i>	<i>9 + 20</i>	

d. If LLW is stored because access to a burial site has been denied, answer (1), (2) and (3) below:

- (1) Adequate control of waste storage is maintained  Y ( ) N
- (2) Package is labeled and package integrity is adequately maintained  Y ( ) N
- (3) Adequate records of surveys and material accountability are maintained  Y ( ) N

e. Disposal of waste in accordance with regulatory requirements [20.301 and 35.92]  Y ( ) N

f. Decay-in-storage waste disposed per [35.92]  Y ( ) N

g. Records maintained [20.401(b) and 35.92(b)]  Y ( ) N

Remarks *Waste collected from DC facility is stored or decayed in storage. Waste collected from Maryland facilities is still sent to North Carolina*

16. NOTIFICATIONS AND REPORTS

- a. Licensee in compliance with [19.13] (reports to individuals)  Y ( ) N ( ) N/A
- b. Licensee in compliance with [20.204] (theft or loss)  Y ( ) N ( ) N/A
- c. Licensee in compliance with [20.403] (incidents)  Y ( ) N ( ) N/A
- d. Licensee in compliance with [20.405] (overexposures)  Y ( ) N ( ) N/A

Remarks .....

.....

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.....

17. MISADMINISTRATIONS

a. Misadministrations have occurred

- (1) Diagnostic
- (2) Therapeutic

b. Licensee in compliance with reporting therapeutic misadministrations [35.33(a),(b)]

*See Comments*

( ) Y ( ) N

( ) Y ( ) N

( ) Y ( ) N

Y ( ) N *N/A*

- c. Licensee in compliance with reporting diagnostic misadministrations, if required [35.33(c)]
- d. Appropriate action taken to prevent recurrence
- e. Records maintained [35.33(d)]

( ) Y ( ) N  
 ( ) Y ( ) N  
 ( ) Y ( ) N

*and other pts*

Remarks - Bone scan pt was injected with <sup>99m</sup>Tc-MDP while this was not an NRC defined misadministration, the QC for pt. ID and dose management was examined. The licensee initiated corrective action in this identified process which is applicable to all dose administrations

18. POSTING AND LABELING

- a. Form NRC-3 "Notice to Workers" posted
- b. Other posting and labeling per [20.203]

() Y ( ) N  
 () Y ( ) N

Remarks .....

19. TRANSPORTATION (10 CFR 71.5(e) and 49 CFR 171.189)

- a. Licensee makes shipments of RAM
- b. If so, describe shipment content and method:

() Y ( ) N

*Licensee has designated placarded vehicle*

- c. Licensee is aware of 10 CFR 61 requirements
- d. Licensee classifies and characterizes waste
- e. Shipments

() Y ( ) N ( ) N/A  
 () Y ( ) N ( ) N/A

- (1) Authorized packages used [173.415,416]
- (2) Package type used .....
- (3) For DOT-7A packages, performance test record on file [173.415(a)]
- (4) For special form sources, performance test record on file [173.476(a)]
- (5) Packages properly labeled [172.403, 173.441]
- (6) Packages properly marked [172.300]
- (7) Proper shipping papers prepared and used [172.200-204]

() Y ( ) N ( ) N/A  
 () Y ( ) N ( ) N/A  
 ( ) Y ( ) N () N/A  
 () Y ( ) N ( ) N/A  
 () Y ( ) N ( ) N/A

Remarks .....

f. Licensee makes return shipments of radiopharmacy doses ( ) Y  N ( ) N/A

(1) If YES, licensee assumes responsibility of all shipper requirements ( ) Y ( ) N

(2) If NO, describe arrangements made between licensee and radiopharmacy as to performance of shipper responsibilities:

.....  
.....  
.....

20. RECORDKEEPING FOR DECOMMISSIONING

a. Records of information important to the safe and effective decommissioning of the facility maintained in an independent and identifiable location until license termination [30.35(g)]

b. Records include all information outlined in [30.35(g)]

Y ( ) N  
 Y ( ) N

Remarks .....

21. INDEPENDENT MEASUREMENTS

a. Survey instrument used .....

b. NRC Serial No. ....

c. Inspector's measurements were compared to licensee's ( ) Y ( ) N

d. Describe the type and results of measurements:

.....  
.....  
.....

NI

22. BULLETINS AND INFORMATION NOTICES

a. Bulletins, Information Notices, etc., received by the licensee

b. Licensee took appropriate actions in response to Bulletins; INs, etc.

Y ( ) N  
 Y ( ) N

Remarks .....





25. PERFORMANCE EVALUATION FACTORS

Licensee WRAMC  
.....  
.....

Inspector J. H. Darden  
Inspection Date 7/20-23/93

- a. Lack of senior management involvement with the radiation safety program and/or Radiation Safety Officer (RSO) oversight ( ) Y (  ) N
- b. RSO too busy with other assignments ( ) Y (  ) N
- c. Insufficient staffing ( ) Y (  ) N
- d. Radiation Safety Committee fails to meet or functions inadequately ( ) Y (  ) N
- e. Inadequate consulting services or inadequate audits ( ) Y (  ) N

Remarks (consider above assessment and/or other pertinent PEFs):

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Regional follow-up on above PEFs citations:

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ADDENDUM

INTERIM FIELD NOTES

QUALITY MANAGEMENT (QM) PROGRAM

1. GENERAL

- a. License number(s): 08-01738-02
- b. Docket number(s): 030-01317
- c. Last inspection date(s): 08/92
- d. Current inspection date(s): 07-20 to 09-23-93

2. MODALITIES

a. Procedures the licensee performs:

- |  |                                  |   |
|--|----------------------------------|---|
| (1) Teletherapy                                      | Y                                | N |
| (2) Gamma Stereotactic Radiosurgery                  | Y                                | N |
| (3) High-Dose-Rate Remote Afterloading Brachytherapy | Y                                | N |
| (4) All Other Brachytherapy                          | <input checked="" type="radio"/> | N |
| (5) NaI I-125 or I-131 > 30 microCi                  | <input checked="" type="radio"/> | N |
| (6) Therapeutic Radiopharmaceutical Other than (5)   | <input checked="" type="radio"/> | N |

3. PROGRAM

a. Licensee has a written QM program, as applicable, that covers all policies/procedures that require a written directive and program review [35.32(a) and (b)(1)]  N (SW)

b. Written QM program and certification (for existing licensees) submitted to NRC [35.32(f)(2)]  N

Date: 1/92

Remarks .....

.....

.....

.....

.....

4.

SUPERVISION

a. Supervised individual(s) instructed in the QM program applicable to the modality of use [35.25(a)(1)]

Y  N (SW)

(1) If any individual(s) has not received training, document their names and position. Additionally, briefly describe the reasons as stated by the individual, the RSO, and the supervising authorized user:

*None were identified*

Date: .....

Remarks .....

Epit

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open Business

Serious Concerns

1. Misadministration

2. Security - Taff

Col. James Zaychuk, Acting  
Commander



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

REGION I  
475 ALLENDALE ROAD  
KING OF PRUSSIA, PA 19406-1415

November 2, 2000

Docket No. 03006895  
Control No. 128757

License No. 08-01738-03

William B. Johnson, Colonel  
Radiation Safety Officer  
Department of the Army  
Walter Reed Army Medical Hospital  
Washington, DC 20307-5001

SUBJECT: DEPARTMENT OF THE ARMY, ISSUANCE OF LICENSE AMENDMENT,  
CONTROL NO. 128757

Dear Colonel Johnson:

This refers to your license amendment request. Enclosed with this letter is the amended license.

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 Judith A. Joustra*

Judith A. Joustra  
Senior Health Physicist  
Nuclear Materials Safety Branch 2  
Division of Nuclear Materials Safety

Enclosure:  
Amendment No. 26

Information in this record was deleted  
in accordance with the Freedom of Information  
Act, exemptions 2  
FOIA-2006-0238

II/1

NMSS/RGN MATERIALS-001

~~11/11/2000~~

DOCUMENT NAME: G:\Docs\Current\Lic Cvr Letter\L08-01738-03.128757.wpd

42567361

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	DNMS/RI			
NAME	JJoustra <i>JAS</i>						
DATE	11/3/00						

OFFICIAL RECORD COPY

*E*

Duplicate

MATERIALS LICENSE

Duplicate

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.

<p>Licensee</p> <p>1. Department of the Army Walter Reed Army Medical Center</p> <p>2. Washington, D.C. 20307-5001</p>	<p>In accordance with letter dated September 27, 2000,</p> <p>3. License number 08-01738-03 is amended in its entirety to read as follows:</p> <hr/> <p>4. Expiration date November 30, 2001</p> <hr/> <p>5. Docket No. 030-06895 Reference No.</p>
--	---

<p>6. Byproduct, source, and/or special nuclear material</p> <p>A. Cobalt 60</p> <p>B. Cesium 137</p> <p>C. Cesium 137</p>	<p>7. Chemical and/or physical form</p> <p>A. Sealed sources</p> <p>B. Sealed sources</p> <p>C. Sealed sources</p>	<p>8. Maximum amount that licensee may possess at any one time under this license</p> <p>A. [ ]</p> <p>B. [ ]</p> <p>C. [ ]</p>
--	--	---

9. Authorized use:

A. In [ ] explosives, flammables or corrosives.	[ ] Irradiators for the irradiation of material except
B. In [ ] flammables or corrosives.	[ ] Irradiators for the irradiation of material except explosives, EX2
C. In [ ] flammables, or corrosives.	[ ] Irradiators for the irradiation of material except explosives,

CONDITIONS

10. Licensed material may be used only at the licensee's facilities located at Walter Reed Army Medical Center, Washington, D.C. and Walter Reed Army Medical Center, Forest Glen Section and Annex, Silver Spring, Maryland.

EX 2

Duplicate  
 MATERIALS LICENSE  
 SUPPLEMENTARY SHEET

Duplicate License Number  
 08-01738-03 Duplicate

Docket or Reference Number  
 030-06895

Amendment No. 26

11. A. Licensed material shall only be used by, or under the supervision of, individuals who have received the training described in application dated March 18, 1991 and have been designated in writing by the Radiation Safety Officer.
- B. The Radiation Safety Officer for this license is COL William B. Johnson.
12. Sealed sources or detector cells containing licensed material shall not be opened or sources removed from source holders by the licensee.
13. 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.
- 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.

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Duplicate  
MATERIALS LICENSE  
SUPPLEMENTARY SHEET

Duplicate

License Number 08-01738-03
Docket or Reference Number 030-06895
Amendment No. 26

- 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 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.
- 14. 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 Commission or an Agreement State to perform such services.
- 15. The licensee shall conduct a physical inventory every six months to account for all sealed sources and devices containing licensed material received and possessed under the license.
- 16. 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.
- 17. The licensee is authorized to transport licensed material in accordance with the provisions of 10 CFR Part 71, "Packaging and Transportation of Radioactive Material."

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Duplicate MATERIALS LICENSE SUPPLEMENTARY SHEET

Duplicate

License Number

08-01738-03

Duplicate

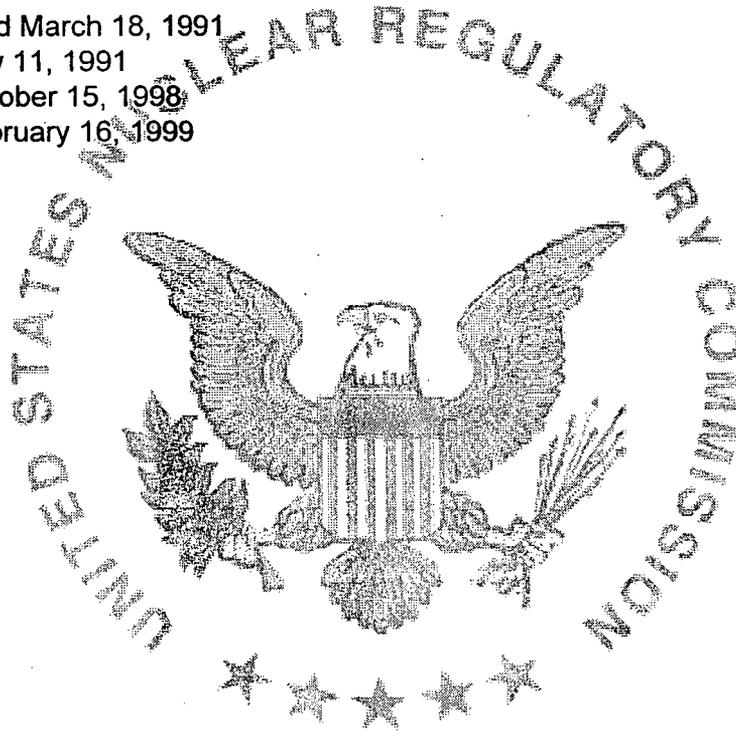
Docket or Reference Number

030-06895

Amendment No. 26

18. 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 March 18, 1991
- B. Letter dated July 11, 1991
- C. Letter dated October 15, 1998
- D. Letter dated February 16, 1999



For the U.S. Nuclear Regulatory Commission

Date November 3, 2000

By

*Original signed by Judith A. Joustra*

Judith A. Joustra  
Nuclear Materials Safety Branch 2  
Division of Nuclear Materials Safety

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Region 1  
King of Prussia, Pennsylvania 19406

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DEPARTMENT OF THE ARMY  
WALTER REED ARMY MEDICAL CENTER  
WALTER REED HEALTH CARE SYSTEM  
WASHINGTON, DC 20307-5001

RECEIVED  
REGION I

REPLY TO  
ATTENTION OF

October 15, 2001

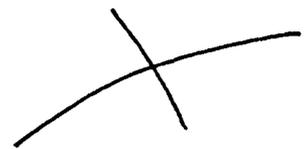
2001 OCT 22 PM 6:38

NMSB2

Preventive Medicine Service

Nuclear Regulatory Commission, Region I  
Medical Licensing Division  
475 Allendale Road  
King of Prussia, Pennsylvania 19406-1415

08-01738-03  
030-06895



Dear Sir or Madam:

Walter Reed Army Medical Center uses radioactive material authorized by U.S. Nuclear Regulatory Commission (NRC) Irradiator License number 08-01738-03 with an expiration date of November 30, 2001.

We request to renew NRC License 08-1738-03 in its entirety. NRC Form 313 with attachments is enclosed for your review.

For any additional information, please contact the undersigned at (202) 356-0058.

Sincerely,

*William B. Johnson*  
William B Johnson  
Colonel, U.S. Army  
Radiation Protection Officer

Copy Furnish:  
Director, Proponency Office for Preventive Medicine - San Antonio,  
ATTN: MCPO-SA (COL Daxon), 2050 Worth Road, Ft. Sam Houston, TX  
78234-6000

II/2

Information in this record was deleted  
in accordance with the Freedom of Information Act

246  
8-023

130465

NMSS/RGNI MATERIALS-002

*William B. Johnson*



(8-1999)  
10 CFR 30, 32, 33  
34, 35, 36, 39 and 40

Estimated burden per response to comply with this mandatory information collection request 7.4 hours. Submittal of the application is necessary to determine that the applicant is qualified and that adequate procedures exist to protect the public health and safety. Send comments regarding burden estimate to the Records Management Branch (T-8 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10/202, (3150-0120), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

# APPLICATION FOR MATERIAL LICENSE

**INSTRUCTIONS: SEE THE APPROPRIATE LICENSE APPLICATION GUIDE FOR DETAILED INSTRUCTIONS FOR COMPLETING APPLICATION. SEND TWO COPIES OF THE ENTIRE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW.**

**APPLICATION FOR DISTRIBUTION OF EXEMPT PRODUCTS FILE APPLICATIONS WITH:**

DIVISION OF INDUSTRIAL AND MEDICAL NUCLEAR SAFETY  
OFFICE OF NUCLEAR MATERIALS SAFETY AND SAFEGUARDS  
U.S. NUCLEAR REGULATORY COMMISSION  
WASHINGTON, DC 20555-0001

**ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS:**

**IF YOU ARE LOCATED IN:**

CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, MAINE, MARYLAND, MASSACHUSETTS, NEW HAMPSHIRE, NEW JERSEY, NEW YORK, PENNSYLVANIA, RHODE ISLAND, OR VERMONT, SEND APPLICATIONS TO:

LICENSING ASSISTANT SECTION  
NUCLEAR MATERIALS SAFETY BRANCH  
U.S. NUCLEAR REGULATORY COMMISSION, REGION I  
475 ALLENDALE ROAD  
KING OF PRUSSIA, PA 19406-1415

ALABAMA, FLORIDA, GEORGIA, KENTUCKY, MISSISSIPPI, NORTH CAROLINA, PUERTO RICO, SOUTH CAROLINA, TENNESSEE, VIRGINIA, VIRGIN ISLANDS, OR WEST VIRGINIA, SEND APPLICATIONS TO:

SAM NUNN ATLANTA FEDERAL CENTER  
U. S. NUCLEAR REGULATORY COMMISSION, REGION II  
81 FORSYTH STREET, S.W., SUITE 23T85  
ATLANTA, GEORGIA 30303-8931

**IF YOU ARE LOCATED IN:**

ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR WISCONSIN, SEND APPLICATIONS TO:

MATERIALS LICENSING SECTION  
U.S. NUCLEAR REGULATORY COMMISSION, REGION III  
801 WARRENVILLE RD.  
LISLE, IL 60532-4351

ALASKA, ARIZONA, ARKANSAS, CALIFORNIA, COLORADO, HAWAII, IDAHO, KANSAS, LOUISIANA, MONTANA, NEBRASKA, NEVADA, NEW MEXICO, NORTH DAKOTA, OKLAHOMA, OREGON, PACIFIC TRUST TERRITORIES, SOUTH DAKOTA, TEXAS, UTAH, WASHINGTON, OR WYOMING, SEND APPLICATIONS TO:

NUCLEAR MATERIALS LICENSING SECTION  
U.S. NUCLEAR REGULATORY COMMISSION, REGION IV  
611 RYAN PLAZA DRIVE, SUITE 400  
ARLINGTON, TX 76011-8064

*030-06895*  
~~X~~

PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSED MATERIAL IN STATES SUBJECT TO U.S. NUCLEAR REGULATORY COMMISSION JURISDICTIONS.

**1. THIS IS AN APPLICATION FOR (Check appropriate item)**

- A. NEW LICENSE
- B. AMENDMENT TO LICENSE NUMBER \_\_\_\_\_
- C. RENEWAL OF LICENSE NUMBER 08-01738-03

**2. NAME AND MAILING ADDRESS OF APPLICANT (Include Zip code)**

Department of the Army  
Walter Reed Army Medical Center  
Bldg 41, Room 38  
Washington, DC 20307

**3. ADDRESS(ES) WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED**  
Walter Reed Army Medical Center, Washington, DC 20307  
Walter Reed Army Institute for Research, Forest Glen Annex  
Silver Spring, MD 20910

**4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION**  
COL William Johnson

TELEPHONE NUMBER  
(202) 356-0058

SUBMIT ITEMS 5 THROUGH 11 ON 8-1/2 X 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.

<b>5. RADIOACTIVE MATERIAL</b> a. Element and mass number; b. chemical and/or physical form; and c. maximum amount which will be possessed at any one time.	<b>6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.</b>
<b>7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING EXPERIENCE.</b>	<b>8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.</b>
<b>9. FACILITIES AND EQUIPMENT.</b>	<b>10. RADIATION SAFETY PROGRAM.</b>
<b>11. WASTE MANAGEMENT.</b>	<b>12. LICENSEE FEES (See 10 CFR 170 and Section 170.31)</b> FEE CATEGORY _____ AMOUNT ENCLOSED \$ _____

**13. CERTIFICATION. (Must be completed by applicant) THE APPLICANT UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BINDING UPON THE APPLICANT.**

THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT, NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PARTS 30, 32, 33, 34, 35, 36, 39 AND 40, AND THAT ALL INFORMATION CONTAINED HEREIN IS TRUE AND CORRECT TO THE BEST OF THEIR KNOWLEDGE AND BELIEF.

WARNING: 18 U.S.C. SECTION 1001 ACT OF JUNE 25, 1948 62 STAT. 749 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

CERTIFYING OFFICER - TYPED/PRINTED NAME AND TITLE Henry K. Jung, MAJ, MS, Executive Officer	SIGNATURE <i>Henry K. Jung</i>	DATE 15 Oct 01
--	-----------------------------------	-------------------

**FOR NRC USE ONLY**

TYPE OF FEE	FEE LOG	FEE CATEGORY	AMOUNT RECEIVED \$	CHECK NUMBER	COMMENTS
APPROVED BY				DATE	130465

We will use instruments that meet the radiation monitoring instruments specifications published in Appendix K to NUREG-1556, Vol 5, 'Consolidated Guidance about materials Licenses: Program-Specific Guidance about Self-Shielded Irradiator Licenses', dated June 1998. Additionally, each survey meter will have been calibrated by the manufacture or other person authorized by the NRC or an Agreement State to perform survey meter calibrations no more than 12 months before the date the meter is used.

Physical inventories will be conducted at intervals not to exceed 6 months, to account for all sealed sources and devices received and possessed under the license.

If we change our operating and emergency procedures without amending our license, we will ensure that: the changes are reviewed and approved by licensee management and the RSO; affected license staff are trained in the procedures before they are implemented; the changes are consistent with applicable license conditions and the procedures or commitments submitted in the license application; and the changes do not degrade the safety of the program. Operating and emergency procedures will be developed, implemented, maintained, and distributed and will meet the Criteria in the section entitled 'Radiation Safety Program, Operating and Emergency Procedures' in NUREG-1556, Vol 5, 'Consolidated Guidance about materials Licenses: Program-Specific Guidance about Self-Shielded Irradiator Licenses', dated June 1998

We will implement and maintain procedures for routine maintenance of our self-shielded irradiators according to each manufacture's written recommendations and instructions. We will have the self-shielded irradiator manufacture or other person authorized by NRC or an Agreement State perform non-routine maintenance.

#### 11. WASTE MANAGEMENT.

Disposal of the licensed material in the irradiators will be accomplished by transferring the irradiators to the supplier or to a licensee specifically authorized to accept it.

#### 12. LICENSE FEES

Fee category	7B	Amount Enclosed	Exception (10CFR 170.11(a)(5))
--------------	----	-----------------	--------------------------------

5. EXPERIENCE WITH RADIATION.(Actual use of Radioisotopes or Equivalent Experience)				
ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE GAINED	DURATION OF EXPERIENCE	TYPE OF USE
<sup>235</sup> U <sup>238</sup> U <sup>239</sup> Pu Pu-Be <sup>241</sup> Am <sup>137</sup> Cs <sup>3</sup> H	216 gm unsealed & soln. sources 3 gm unsealed source 43 gm, liquid sources 3 Ci, Sealed 600 mCi, Sealed 120 Ci, Sealed 110 Ci, Sealed	U.S. Army Environmental Hygiene Agency Aberdeen Proving Ground, MD  NRC Byproduct Material License	June 1992 - May 1994 (2 years)	Health Physics Surveys; Principle User, Member of the Radiation Control Committee
Atomic No. 1-83 <sup>131</sup> I <sup>133</sup> Xe <sup>85</sup> Kr <sup>32</sup> P <sup>14</sup> C <sup>125</sup> I <sup>192</sup> Ir <sup>51</sup> Cr <sup>35</sup> S <sup>3</sup> H <sup>99</sup> Mo <sup>99m</sup> Tc <sup>90</sup> Sr <sup>137</sup> Cs <sup>153</sup> Gd <sup>125</sup> I <sup>125</sup> I <sup>137</sup> Cs <sup>60</sup> Co <sup>241</sup> Am <sup>63</sup> Ni <sup>129</sup> I <sup>103</sup> Pd Thorium Uranium Depleted U <sup>137</sup> Cs	400 mCi each not to exceed 26 Ci. 2 Ci; any form 2 Ci; any form 1 Ci; any form 2 Ci; any form 2 Ci; any form 1 Ci; any form 1 Ci; any form 0.75 Ci; any form 1 Ci; any form 5 Ci; any form 23 Ci Generators 23 Ci; any form 0.5 Ci; sealed 2 Ci; sealed 2 Ci; sealed 1 Ci; seeds 1.2 Ci; sealed 1.2 Ci; sealed 0.5 Ci; sealed 20.5 Ci; sealed 1 Ci; sealed; foils 1 Ci; sealed 3 Ci; sealed 5 kg; any 50 kg; any 400 kg; Plated 83,200 Ci; 3 irradiators	Walter Reed Army Medical Center, Washington, D.C.  Radiation Safety Officer for Broad Scope Type A, NRC Byproduct License (Medical Human Use and Non Human Use) No. 08-01738-02 and USNRC BML No. 08-01738-03 for irradiators.	May 1994 to Present	RSO, Chief Health Physics, Health Physics Surveys, Iodinations, Calibrations, Dosimetry, and Bioassay; Manager of complete Radiation Safety Program.

## CURRICULUM VITAE

COL WILLIAM B. JOHNSON, Ph.D, Medical Service Corps, US Army

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### ACADEMIC AREAS OF INTEREST:

Medical Physics, Health Physics, Optimizing Medical Images, Quality Control in Radiology, Mammography, Computers, Public Health

### EDUCATION AND TRAINING:

#### CIVILIAN TRAINING:

##### *University Training:*

University of North Carolina, Chapel Hill, NC, Ph.D., Radiological Hygiene & Medical Physics [ ] Ex 6

Tulane School of Public Health and Tropical Medicine, New Orleans, LA, MPH, Environmental Health [ ] Ex 6

Iowa State University, Ames, IA, BS, Mathematics, [ ] Ex 6

##### *Short Courses and Continuing Education:*

Digital Mammography Training Program, Northwestern University Medical School, Chicago, IL, 8 hours, 20 June 2001.

Radiological WMD Workshop & Tabletop Exercise, District of Columbia Emergency Management Agency, 8 hours, 27 April 2000.

Ionizing Radiation Science & Protection in the 21<sup>st</sup> Century, NCRP 36<sup>th</sup> Annual Meeting, Arlington, VA, 5-6 April 2000.

Emerging Issues in Mammography, University of Virginia School of Medicine, Charlottesville, VA, 24-25 September 1999, 15 hours.

**PERSONAL INFORMATION WAS REMOVED  
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## Curriculum Vitae William B. Johnson

American Academy of Health Physics Courses, Philadelphia, PA, June 1999  
MARSSIM for Managers - 16 Continuing Education Credits (CECs);  
Compliance with the Final MQSA Regulations-A Primer for Physicists - 4 CECs;  
Final Status Surveys Using MARSSIM Process - 4 CECs;  
Health Physics for Research Reactors - 4 CECs;  
Putting MARSSIM to Work I - 4 CECs;  
University & Medical Radioactive Waste Management - 4 CECs;

Radiation Protection in Medicine: Contemporary Issues, NCRP 35<sup>th</sup> Annual Meeting,  
Arlington, VA, 7-8 April 1999.

American Academy of Health Physics Courses, San Antonio, TX, July 1997:  
In Vivo Measurement of Internally Deposited Radionuclides - 16 Continuing  
Education Credits (CECs);  
MQSA Procedures & Impact on Mammography Practice - 4 CECs;  
Basic Local Exhaust Ventilation for Health Physicists - 4 CECs;  
Demystifying Internal Dose Calculations - 4 CECs;  
Current Approaches to Regulation Public Radiation Exposures - 4 CECs;  
University & Medical Radioactive Waste Management - 4 CECs;  
Mitigating Radiation Dose To Patient and Staff - 4 CECs.

X-Ray Mammography, Basic Physics & Quality Assurance, University of Texas  
Health Science Center, San Antonio, TX, January 1997, 16 hours.

American College of Radiology's Mammographic Image Quality Course: Role of  
the Medical Physicist, January 1994, Cincinnati, Ohio, 18 CME credits awarded.

Radiological Society of North America (RSNA) 78<sup>th</sup> Meeting: Technical Aspects of  
Breast Imaging; Accreditation/QC; Specification, Medical Physics Testing, Physics Forum,  
6.0 CME credits awarded, 1992.

Radiological Society of North America (RSNA) 77<sup>th</sup> Meeting, Technical Aspects &  
Quality Control in Mammography, 1.5 CME credits awarded, 1991.

International Society for Optical Engineering Medical Imaging V Meeting, San Jose,  
CA, 1 week, 1991.

MRI Acceptance Testing and Quality Control, The Bowman Gray School of  
Medicine, Winston-Salem, NC, 1 week, 1988.

## Curriculum Vitae William B. Johnson

Health Physics In Radiation Accidents, Oak Ridge Associated Universities, Oak Ridge, TN, 1 week, 1985.

Health Physics Aspects of Nuclear Attack, Health Physics Summer School, Louisiana University, Hammond, LA, 1 week, 1984.

Electronic Imaging in Medicine, University of Texas at San Antonio, TX, 1 week, 1983.

Ionizing and Nonionizing Radiation in Medicine, University of Pennsylvania, Philadelphia, PA, 1 week, 1979.

Medical X-Ray Protection Course, USPHS, Rockville, MD, 2 weeks, 1973.

### MILITARY TRAINING:

Army Medical Department Radiation Health Sciences Course, US Army Center for Health Promotion and Preventive Medicine, APG, MD, 1 week, 1994, 1995, 1996, 1997, 1998, 1999.

Association of Military Surgeons of the United States (AMSUS) 104th Annual Meeting, Chemical, Biological and Radiation Threats: A Challenge for Federal Medicine, 61-21 November 1997, 32 hours.

Medical Physics and Military Medicine, US Army Environmental Hygiene Agency, Aberdeen Proving Ground, MD, 1 week, 1983, 1985, 1987, 1988, 1989, 1991, 1993.

Medical Effects of Nuclear Weapons, Armed Forces Radiobiology Research Institute, Bethesda, MD, 1 week, 19-23 September 1983.

Faculty Development Course, Academy of Health Sciences, Ft. Sam Houston, TX, 4 weeks, 1976.

Command and General Staff Officer Course (Correspondence Option), 1 year, 1987.

AMEDD Officer Advanced Course, Ft. Sam Houston, TX, 24 weeks, 1975.

AMEDD (MSC) Officer Basic Course, Ft. Sam Houston, TX, 9 weeks, 1972

## Curriculum Vitae William B. Johnson

Nuclear Power Plant Operator Course (Health Physics Specialty), Ft. Belvoir, VA, 1 year, 1971.

### TEACHING EXPERIENCE:

1990-1993, Assistant Professor of Preventive Medicine and Biometrics, Uniformed Services University of the Health Sciences, Bethesda, MD.

1977-1979, Instructor, Radiological Physics, Academy of Health Sciences, Ft. Sam Houston, TX.

1977-1979, Assistant Professor of Health Sciences, Baylor University at San Antonio, San Antonio, TX.

1969-1970, High School Teacher (Mathematics), Grant Community High School, Fox Lake, IL.

### PROFESSIONAL EXPERIENCE:

1. April 1995 to Present, Radiological Hygiene Consultant to The U.S. Army Surgeon General and Nuclear Medical Science Officer Consultant to the Chief, Medical Service Corps.

Duties: Provide policy and regulatory guidance to The Surgeon General (TSG) for all radiological hygiene issues as requested by TSG. Policies and guidance are used worldwide by all U.S. Army Medical Units. Provides guidance to all Army Commands related to occupational exposure to ionizing radiation, radiation hazard analysis of all end-items used by soldiers containing radioactive material, and environmental exposures. Coordinates and participates with U.S. National and International Organizations (such as the National Council on Radiation Protection) as the TSG representative. As the Nuclear Medical Science Officer (NMSO) Consultant, provides career guidance to 60 officers including programing assignments, sponsoring professional short courses, and coordinating and approving graduate training for MS and PhD. programs.

1a. May 1994 to Present, Chief, Health Physics Office, Walter Reed Army Medical Center, Washington, D.C.

Duties: Lead and manage the Health Physics Office composed of three technical branches and an administrative section. Directs the activities of 20 professionals in support of a two Nuclear Regulatory Commission Medical Byproduct Material Licenses, and is the Radiation Safety Officer. Institutions included on the NRC license include Walter Reed

## Curriculum Vitae William B. Johnson

Army Medical Center, the Armed Forces Institute of Pathology, and Walter Reed Institute of Research. In addition, provides direct medical physics support in support of mammography, computed tomography, and magnetic resonance imaging. Support of mammography includes medical physics acceptance testing of all new mammography systems, annual medical physics surveys to support American College of Radiology Accreditation, and providing support in review of all quality assurance issues. Extensive mammography support includes operations at Walter Reed Army Medical Center and at all Army Community Hospitals and Health Clinics in the Walter Reed Region. Currently providing direct services to ten mammographic facilities to meet ACR requirements for accreditation.

2. June 1992 to April 1994, Chief, Health Physics Division, U.S. Army Environmental Hygiene Agency, Aberdeen Proving Ground, MD.

Duties: Leads and manages the Health Physics Division composed of the Medical Health Physics Branch, the Industrial Health Physics Branch and an Administrative Section. Directs the activities of some 25 professional health physicists in world wide mission of support of U.S. Army Radiation Protection Programs. Support includes complete radiation protection program evaluations for compliance with Federal, Army, and Nuclear Regulatory Commission (NRC) Licenses for Medical and Industrial facilities, medical and industrial x-ray surveys, radiation dose assessments from bioassay data, assistance in preparation of documents to terminate NRC licenses, and conducting verification surveys for NRC License termination. Radiation protection policies are developed for the Army Surgeon General for implementation Army wide. Act as Army Surgeon General consultant on ACR Mammography Accreditation for all Army Medical Treatment facilities. Provide training to survey officers on acceptance testing of mammographic systems, and train individuals on ACR mammography requirements. Act as principle user of radioactive materials, supervisor of  $^{137}\text{Cs}$  irradiator for calibration, and member of the Radiation Control Committee.

3. June 1989 to June 1992, Deputy Director, Environmental Health and Occupational Safety; Chief, Radiation Safety and Radiation Protection Officer, Uniformed Service University of the Health Sciences (USUHS), Bethesda, MD.

Duties: Responsible for the supervision and management of broad scope US Nuclear Regulatory Byproduct Materials License No. 19-23344-01. Supervises health physics personnel in the performance of laboratory radiation protection surveys, personnel dosimetry program, laboratory analysis, and radioactive material control. Provides technical advice to some 350 radiation workers working in about 150 radioisotope laboratories. Teaches in various graduate level courses in Preventive Medicine and Radiology. Provides technical consultation to Director and other Branch Chiefs. Acts as the Director when the Director is absent. Has been designated the Medical Physics

## Curriculum Vitae William B. Johnson

Consultant on acquisition and acceptance testing of Computerized Tomography (CT) Systems and Magnetic Resonance Imaging (MRI) Systems for the Army Surgeon General. This CT and MRI mission is world wide.

4. June 1983-June 1989, Chief, Health Physics, Dwight D. Eisenhower Army Medical Center, Ft. Gordon, GA.

Duties: Served as Chief, Health Physics, and Radiation Protection Officer. Responsible for supervision and management of broad scope radiation protection program including management of US Nuclear Regulatory Byproduct Materials License No. 10-12044-03 and Department of Army Radioactive Materials Authorization No. 10-07-81. Served as Regional Consultant to DOD Health Region 10, which includes 9 Army Community Hospitals, and clinics in Panama and Puerto Rico. Performs Technical Surveys of radioactive materials and radiation producing devices to evaluate health hazards and performs medical physics evaluations to optimize imaging. Provides education support to professional staff. Supervises the personnel dosimetry program and performs dosimetry analysis of both radiation workers and patients. Provide mammographic surveys throughout the Region in support of ACR Accreditation. Is the Medical Physics Consultant on acquisition and acceptance testing of Computerized Tomography (CT) Systems and Magnetic Resonance Imaging (MRI) Systems for the Army Surgeon General. This CT and MRI mission is world wide.

5. September 1976 - June 1980, Chief, X-Ray Branch, Academy of Health Sciences, Ft. Sam Houston, TX.

Duties: Programs, plans and supervises overall operation of branch, including performance of 36 instructors and about 430 students annually. Branch is responsible for teaching the x-ray technologist program (radiographic) for the US Army. Also coordinates, plans, and supervises clinical training. Serves as Chairman of X-Ray Specialist Curriculum Committee, and Chairman of Medicine and Surgery Division Physics and Biophysics Committee. Serves as subject matter expert in radiology for Combat Development and Health Care Systems.

6. January 1975 - July 1975, Chief, Health Physics Branch, US Army Environmental Hygiene Agency Regional Activity South, Ft. Sam Houston, TX.

Duties: Conducts radiation protection surveys of US Army installations containing or generating ionizing radiation. Geographical area of support is all states west of the Mississippi River. Also reviews NRC license and DA Authorization applications. Performs technical consultation on radiation safety hazards.

Curriculum Vitae William B. Johnson

7. March 1974 - December 1974, Chief, Department of Nuclear Medical Sciences, US Army Medical Laboratory, Ft. Sam Houston, TX.

Duties: Supervises laboratory procedures and techniques of radiation biology, radiochemistry, and biophysics for regional reference laboratory. Geographic area of support includes United States, Pacific Region, Korea, and Panama. Supervises radiation detection measurements, preparation and analysis of radioisotopes in support of diagnostic and other clinical procedures. Provides support on environmental surveillance. Advises on radiological hygiene matters to prevent unnecessary exposure of personnel to ionizing radiation. Performs duty of Chairman, Radioisotope Committee, and Radiological Protection Officer. Manages all aspects of AEC License No. 42-06316-01, and Department of Army Authorization for Radioactive Materials. Performs Health Physics surveys and overall monitoring of all Laboratory Departments engaged in work involving radioactive material.

8. January 1973 - February 1974, Survey Officer, Health Physics Division, US Army Environmental Hygiene Agency, Aberdeen Proving Ground, MD.

Duties: Reviews AEC license and Department of Army Authorizations applications as well as drafts Army directives and technical publications pertaining to radiological health; evaluates proposed in-system items containing or generating ionizing radiation; makes on-site surveys of Army diagnostic, industrial, and therapeutic x-ray facilities, radioactive sources, accelerators, human use of radioisotopes and other sources of ionizing radiation; prepares reports with recommendations for corrective action; assists in training activities. Performs as Alternate Radiological Protection Officer. This requires preparation and maintenance of records and reports on receipt, issue, use, inventory, storage, and disposal of radioactive materials. Performs health physics surveys of all agency divisions engaged in working with radioactive materials.

9. September 1972 - October 1972, Health Physics Technician, SM1 Nuclear Power Plant, Ft. Belvoir, VA.

Duties: Conducts radiological surveys, performs treatment to maintain proper process fluid conditions of nuclear power plant. Operates nuclear power plant controls and equipment. Assists in refueling operations and preparing spent fuel elements and demineralizers for storage and shipment. Monitors process fluids for radioactivity and performs chemical separations. Conducts radiological surveys of nuclear power plant personnel, equipment, work areas and reactor elements.

Curriculum Vitae William B. Johnson

**MEMBERSHIPS, PAPERS, PRESENTATIONS AND AWARDS:**

Member, Health Physics Society (1973)

Member, Eta Chapter, Delta Omega Society (1977)

Member, The Association of Military Surgeons of the United States (1998)

Member, The Order of Military Medical Merit (1999)

"The Final Step in Decommissioning of the SM-1A Nuclear Power Plant: A Closeout Survey," AEHA Report No. 43-001-74, Health Physics National Meeting, 1974.

"A Data Base Management System For Real-Time Monitoring of Operating Parameters of A Diagnostic X-Ray System," Ph.D. Dissertation, University of North Carolina, Chapel Hill, NC, 1983.

"Computerized Quality Assurance in Diagnostic Radiology," Health Physics National Meeting, Baltimore, MD, 1983.

"Acceptance Testing of Computerized Tomography Systems," Savannah River Chapter Health Physics Society Meeting, September 1985.

"Operational Problems for a Radiation Protection Program at A Major Medical Institution," Medical Physics in Military Medicine Course, AEHA, MD, September 1987.

"A Protocol to Comply With The Joint Commission of Accreditation of Health Care Organizations Requirements in Diagnostic Radiology," Medical Physics In Military Medicine Course, USAEHA, MD, October 1988.

"Acceptance Testing of Computerized Tomography Systems Course," 24 hours, USAEHA, February 1993.

"Mammography Physics and Performance Testing," 4 hour mini-course, AMEDD Health Sciences Course, USACHPPM, October 1994.

"Mammography Accreditation/Certification and MQSA," 2 hour presentation, Basic Radiation Protection Officer's Course, USACHPPM, August 1996, April 1999.

"MQSA Final Regulations & Implications for Medical Physicist," 2 hour presentation, Preventive Medicine Health Force Protection Conference, Atlanta, GA, August 1999.

DEPARTMENT OF THE ARMY  
HEADQUARTERS, WALTER REED ARMY MEDICAL CENTER  
WASHINGTON, DC 20307-5001

WRAMC Regulation  
No. 40-10

2 June 1999

Medical Services  
HEALTH PHYSICS

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## Chapter 1 General

**1-1. Purpose.** The purpose of this regulation is to supplement applicable Federal, State and Army regulations governing the methods for control of potential health hazards resulting from the procurement, possession, storage, transportation, use and disposal of radioactive materials and equipment capable of producing potentially hazardous radiation.

**1-2. Applicability.** This regulation is applicable to all activities assigned or attached to Walter Reed Army Medical Center (WRAMC) for Health Physics support.

**1-3. References.** Required and related publications are listed in appendix A.

**1-4. Definitions and Terms.** The definitions, terms, and abbreviations that are used in this regulation are listed in the glossary.

### 1-5. ALARA

#### a. Management Commitment.

(1) The management of this medical facility is committed to the program described herein for keeping individual and collective doses as low as reasonable achievable (ALARA). In accordance with this commitment, we hereby describe an administrative organization for radiation safety and will develop the necessary written policy, procedures, and instructions to foster the ALARA concept within our institution. The organization will include a Radiation Control Committee (RCC) and a Radiation Protection Officer (RPO).

(2) We will perform a formal annual review of the radiation safety program, including ALARA considerations. This will include reviews of operating procedures and dose records, inspections, and consultations with the radiation safety staff or outside consultants.

(3) Modifications to operating and maintenance procedures and to equipment and facilities will be made if they will reduce exposures unless based upon an ALARA analysis is considered to be unjustified. We will be able to demonstrate, if necessary, that improvements have been made, that modifications have been considered, and that they have been implemented when reasonable. If modifications have

been recommended but not implemented, we will be prepared to describe the reasons for not implementing them.

(4) In addition to maintaining doses to individuals as far below the limits as is reasonable achievable, the sum of the doses received by all exposed individuals will also be maintained at the lowest practicable level. It would not be desirable, for example, to hold the highest doses to individuals to some fraction of the applicable limit if this involved exposing additional people and significantly increasing the sum of radiation doses received by all involved individuals.

Stochastic Limit (TEDE) <sup>1</sup>	5 rem in 1 year
Nonstochastic Limit H <sub>d</sub> and CEDE other than the eye	50 rem in 1 year
Shallow Dose Equivalent H <sub>s</sub> Skin or Extremity	50 rem in 1 year
Lens of the Eye	15 rem in 1 year
Dose to Embryo or Fetus <sup>2</sup>	0.5 rem in gestation period
Planned Special Exposures	Not Allowed Without Waiver
Emergency Exposure Limits (Life Saving)	100 rem
Emergency Exposure Limits (Not Life Saving)	10 rem

<sup>1</sup> Total Effective Dose Equivalent (TEDE) = External Exposure at a depth of 1 cm in tissue (H<sub>e</sub>), and committed effective dose equivalent (CEDE) from internal exposure

<sup>2</sup> H<sub>d</sub> to pregnant woman and dose to the embryo or fetus (after notifying the RPO in writing)

Members of the Public	0.1 rem in any one year
Occupationally Exposed Individuals <sup>1</sup>	0.5 rem in any one year
Occupationally Exposed Minors (Under 18 years of age)	10% of the annual dose limits for occupationally exposed adults

<sup>1</sup> Individuals who occasionally enter restricted areas must not receive a radiation exposure in excess of that permitted for any member of the public, however, transient operations may exist which require exposure of individuals not normally occupationally exposed to be exposed to levels in excess of 0.1 rem limit. Approval for this practice must be obtained in advance from OTSG and the NRC as per 10 CFR 20 for licensees.

(mrems per calendar quarter)	Level I	Level II
Whole Body <sup>1</sup>	125	375
Lens of the Eye	375	1,125
Other <sup>2</sup>	1,250	3,750

<sup>1</sup> TEDE

<sup>2</sup> Other includes: Shallow-dose equivalent ( $H_s$ ) to the skin or to any extremity, or the sum of the deep-dose equivalents ( $H_d$ ) and the committed dose equivalents ( $H_T$ ) to any individual organ or tissue other than the lens of the eye.

b. Radiation Control Committee.

(1) Review Proposed Users and Uses.

(a) The RCC will thoroughly review the qualifications of each applicant concerning the types and quantities of materials and methods of use for which application has been made to ensure that the applicant will be able to take appropriate measures to maintain exposure ALARA.

(b) When considering a new use of byproduct material, the RCC will review the efforts of the applicant to maintain exposure ALARA.

(c) The RCC will ensure that the users justify their procedures and that individual and collective doses will be ALARA.

(2) Delegation of Authority.

(d) The RCC will delegate authority to the RPO for enforcement of the ALARA concept.

(e) The RCC will support the RPO when it is necessary for the RPO to assert authority. If the RCC has overruled the RPO, it will record the basis for its action in the minutes of the quarterly meeting.

(3) Review of the ALARA Program.

(a) The RCC will encourage all users to review current procedures and develop new procedures as appropriate to implement the ALARA concept.

(b) The RCC will perform a quarterly review of occupational radiation exposure with particular attention to instances in which the investigation levels in Table 1-3 are exceeded. The principal purpose of this review is to access trends in occupational exposure as an index of the ALARA program quality and to decide if action is warranted when investigation levels are exceeded (see

paragraph 1-5.f. below for a discussion of investigation levels).

(c) The RCC will evaluate our institution's overall efforts for maintaining doses ALARA on an annual basis. This review will include the efforts of the RPO, authorized users, and workers as well as those of management.

c. Radiation Protection Officer.

(1) Annual and Quarterly Review.

(a) Annual Review of the Radiation Safety Program. The RPO will perform an annual review of the radiation safety program for adherence to ALARA concepts. Reviews of specific methods of use may be conducted on a more frequent basis.

(b) Quarterly Review of Occupational Exposures. The RPO will review at least quarterly the external radiation doses of authorized users and workers to determine that their doses are ALARA in accordance with the provisions of Section 6 of this program and will prepare a summary report for the RCC.

(c) Quarterly Review of Records of Radiation Surveys. The RPO will ensure radiation surveys in unrestricted and restricted areas are reviewed to determine that dose rates and amounts of contamination were at ALARA levels during the previous quarter.

(2) Education Responsibilities for the ALARA Program.

(a) The RPO will schedule briefings and education sessions to inform workers of ALARA program efforts.

(b) The RPO will ensure that authorized users, workers, and ancillary personnel who may be exposed to radiation will be instructed in the ALARA philosophy and informed that management, the RCC, and the RPO are committed to implementing the ALARA program.

(3) Cooperative Efforts for Development of ALARA Procedures.

(a) Radiation workers will be given opportunities to participate in formulating the procedures that they will be required to follow.

(b) The RPO will be in close contact with all users and workers to develop ALARA procedures for working with radioactive materials.

(c) The RPO will establish procedures for receiving and evaluating suggestions of individual workers for improving health physics practices and will encourage the use of those procedures.

(4) Reviewing Instances of Deviation from Good ALARA Practices. The RPO will investigate all known instances of deviations from good ALARA practices and, if possible, will determine the causes. When the cause is known, the RPO will implement changes in the program to maintain doses ALARA.

d. Authorized Users.

(1) New Methods of Use Involving Potential Radiation Doses.

(a) The authorized user will consult with the RPO during the planning stage before new use of radioactive materials.

(b) The authorized user will review each planned use of radioactive materials to ensure that doses will be kept ALARA.

(2) Authorized User's Responsibility to Supervised Individuals.

(a) The authorized user will explain the ALARA concept and the need to maintain exposures to all supervised individuals.

(b) The authorized user will ensure that supervised individuals who are subject to occupational radiation exposure are trained and educated in good health physics practices and in maintaining exposures ALARA.

e. Individuals Who Receive Occupational Radiation Doses.

(1) Workers will be instructed in the ALARA program and its relationship to work procedures and work conditions.

(2) Workers will be instructed of recourses available if they feel that ALARA is not being promoted on the job.

f. Establishment of Investigation Levels in Order to Monitor Individual Occupational External Radiation Doses.

(1) This institution hereby establishes investigation levels for occupational external radiation doses that, when exceeded, will initiate review or investigation by the RCC and/or the RPO. The investigation levels that we have adopted are listed in Table 1-3. These levels apply to the exposure of individual workers.

(2) The RPO will review and record on the Automated Dosimetry Report (ADR) results of personnel monitoring not less than once in any calendar quarter. The following actions will be taken if the investigation levels as stated in Table 1-3 are exceeded.

(a) Personnel Dose is Less Than Investigation Level I. Except when deemed appropriate by the RPO, no further action will be taken in those cases where an individual's dose is less than Table 1-3 values for the Investigational Level I.

(b) Personnel Dose is Equal to or Greater Than Investigation Level I but Less Than Investigation Level II. The RPO will review the dose of each individual whose quarterly dose equals or exceeds Investigation Level I and will report the results of the reviews at the first RCC meeting following the quarter when the dose was recorded. If the dose does not equal or exceed Investigation Level II, no action related specifically to the exposure is required unless deemed appropriate by the Committee. The Committee will, however, review each such dose in comparison with those of others performing similar tasks as an index of ALARA program quality and will record the review in the Committee minutes.

(c) Personnel Dose is Equal To or Greater Than Investigation Level II. The RPO will investigate in a timely manner the causes of all personnel doses equaling or exceeding Investigation Level II and, if warranted, will take action. A report of the investigation, any actions taken, and a copy of the individual's ADR will be presented to the RCC at its first meeting following completion of the investigation. The details of these reports will be included in the RCC minutes.

(d) Re-establishment of Investigation Levels to Above Those Listed in Table 1-3. In cases where a worker's or a group of workers' doses needs to

exceed an investigation level, a new, higher investigation level may be established for that individual or group on the basis that it is consistent with good ALARA practices. Justification for new investigation levels will be documented.

(e) The RCC will review the justification for and must approve or disapprove all revisions of investigation levels.

## Chapter 2 Training

**2-1. Purpose.** The NRC requires training for any employee who works in or frequents the vicinity of any radiation area. The Commander, WRAMC, has implemented training programs pertaining to the hazards of radiation and the methods for minimizing those hazards for radiation workers and other personnel.

### 2-2. Training Programs

#### a. Initial Briefing.

(1) The Principal User is responsible for the safe use of Radioisotopes and is required to give initial and annual briefings to all personnel working in areas designated on their authorization. The briefings will cover as a minimum, the following:

(a) WRAMC Notice to Employees (Provides basic "Right to Know" information). The Health Physics personnel post notices in each laboratory or in a location accessible to all workers that use radioactive materials.

(b) NRC Form - 3, Notice to Employees.

(c) Title 10, Code of Federal Regulations, Parts 19 (Notices, Instructions, and Reports to Workers; Inspections), 20 (Standards for Protection Against Radiation), and 21 (Reporting of Defects and Noncompliance).

(d) Information concerning the storage, transfer, use and disposal of radioisotopes allowed under the authorization.

(e) Authorization to Use Radioisotopes, WRAMC Form 1661 (Application for Authorization to Use Radioactive Material - Human Use) and/or WRAMC Form 1662 (Application for Authorization to Use Radioactive Material-Nonhuman Use).

(f) Hazards and protective measures associated with isotope usage or exposure to other sources of radiation.

(g) Occupational Dose Records. Review the dosimetry report for the authorization and the means to keep exposures ALARA.

(h) Pregnancy Surveillance Program.

(2) All personnel will acknowledge receiving and understanding the above information by signing and dating WRAMC Form 538 (Radiation Worker Briefing).

b. Introductory Principles of Radiation Protection Course: This one day course, given by the staff of the HPO, is designed to provide the minimum initial training required to use radioactive material, and to reinforce the training provided by the Principal User. It provides supplementary training, in an academic setting, required for the safe handling of radioisotopes and protection of individuals from external and internal radiation hazards. All radiation workers must attend this course (presented at least twice a year), as soon as possible after beginning work at WRAMC. Failure to attend the course by a worker's second opportunity will result in consideration being given to suspending that worker's authorization to work with radioactive materials. An examination is given at the end of this course. If the student fails the exam it may be retaken after additional preparation. The student may also elect to retake the course.

c. Laser Safety Course: This fully accredited one day course, is designed as an instructional and practical laser safety course which is required for certification as a hospital laser user. All laser users shall attend this course (presented at least twice a year), as soon as possible after beginning work at WRAMC. Failure to attend the course by a worker's second opportunity will result in not being given laser privileges at WRAMC. This course is primarily designed for hospital laser users and is not required for WRAIR, NMRI and AFIP research laser users, however, it is strongly encouraged that they attend.

d. Principal User Classes. The senior staff of the HPO conducts periodic classes on selected topics. These topics are based on the need to disseminate current information on license and regulation changes, to correct deficiencies that have been noted and to enhance the professional competency of individuals working in radiation environments. This

is mandatory for Principal Users. Coworkers are encouraged to attend.

e. **Nursing In-service:** Annual radiation safety training for nursing staff who encounter patients undergoing therapy with radioisotopes. Specific details on the types of therapy or other procedures are covered.

f. **Support Personnel Briefing:** Presented annually to personnel whose duties occasionally take them into restricted areas. It will familiarize them with the signs, placards, and color-codes associated with radioactive material use. It also gives a general outline of radiation hazards and contamination procedures and reinforces the ALARA principle.

g. **Fire Fighters Briefing.** Presented annually and covers methods of designating where radioactive materials are used, use of radiation detection instruments, notification procedures and procedures for ensuring protection from contamination and internal deposition.

h. **Military Police and Security Personnel Briefing.** Discusses where radioactive material are used, notification procedures and procedures for ensuring protection from contamination and internal deposition.

i. **On-The-Job Training.** Supervisors will conduct on-the-job training of sufficient content and duration to ensure that all personnel under their supervision know how to safely perform their work. As a minimum, the immediate supervisor will:

(1) Explain the hazards associated with the job the employee is to perform, the corresponding safe practices to be followed, and the standing operating and emergency procedures for the operations.

(2) Explain the steps required to perform the job and the equipment to be used (including safety equipment).

(3) Where possible, demonstrate how the operations are performed and allow the employee to practice the steps and constructively critique the employee's performance.

(4) Periodically spot check the employee's safety practices.

## Chapter 3

### Authorization to Use Radioactive Material

#### 3-1. General

a. **NRC Licenses.** The NRC has issued two Byproduct Material licenses to WRAMC allowing the use of specific types and quantities of byproduct radioactive material. In addition, the Department of the Army controls all non-byproduct radioactive material exempt from NRC specific license control or byproduct material used, stored or disposed of outside the United States, its territories or possessions.

b. **The RCC issues Radioactive Material Authorizations to Principal Users** as a means of controlling the use of radioactive material. All users of radioactive material must receive their authorization prior to receiving and using the material.

c. **Nonhuman Use Radioactive Material Authorizations** are issued for 3 years. **Human Use Authorizations** are issued for 1 year. Both types of authorizations may be renewed upon request.

d. **Individuals possessing more than 225 grams of natural uranium compounds (such as uranyl acetate) are required to obtain an authorization.**

e. **Contractors or non-government agencies wishing to use radioactive sources on U.S. Army installations must obtain the appropriate Department of the Army Radiation Permit (DARP) or Department of the Army Radiation Authorization (DARA), or local Command approval in accordance with the guidelines in AR 385-11. The user will submit a written request to the HPO, and include at least the following information:**

(1) Use and storage information and use location.

(2) Copy of the applicable license(s).

(3) Operating procedures.

(4) Radioactive source(s), element, atomic number, and activity.

(5) Estimated length of operation.

(6) A statement of understanding that the HPO will be notified before bringing radioactive materials on the installation.

(7) In the unlikely event that the sealed source leaks and contaminates Federal property, the contractor or agency will restore the property to Nuclear Regulatory Commission's unrestricted use criteria.

f. The NRC requirements stipulate that a Radiation Control Committee be established to exercise administrative control over the safe use of these radioactive materials. The WRAMC RCC has been chartered to meet these requirements.

### 3-2. Application Procedure

a. To obtain, amend, renew, or terminate an authorization for use of radioactive material, individuals must submit WRAMC Form 2046R (Application for Authorization to Use Radioactive Material-Human Use) 1 June 1996, WRAMC Form 1662 (Application for Authorization to Use Radioactive Material-Nonhuman Use) or a memorandum clearly indicating their authorization amendment request. Each Principal User and coworker must submit WRAMC Form 1643 (Training and Experience of Authorized Radioisotope Users) with the application. Each physician listed on a Human Use Authorization is required to submit NRC Form 313-M Supplement B (Preceptor Statement) or a certificate of board certification with the application. Protocols describing the use and accountability of radioactive material from the time of receipt until the time of disposal will be submitted with the application on WRAMC Form 1644 (Health Physics Radioactive Protocol). Applications will be submitted to the HPO for review and approval. All applications for human use of radioisotopes will be submitted to the Human Use Subcommittee of the RCC by the HPO for review of physician training and experience.

b. All requested information on the application must be provided. Incomplete applications will be returned, causing a delay in approval.

c. Application for use of gamma cell irradiators must include a copy of the proposed Standing Operating Procedures (SOP) addressing personnel safety, routine operation and emergency provisions.

**3-3. Review Procedures.** All applications will be reviewed by the RCC and HPO to ensure that;

individuals meet the training and experience requirements, proposed procedures do not violate existing regulations, and facilities and equipment are adequate for proposed usage. If human use or nonhuman use applications meet the approval of the appropriate subcommittee of the RCC, they will be signed by the Chairman of the Human Use Subcommittee and granted interim approval. All interim approvals will be reviewed by the next convening RCC for final approval.

**3-4. Termination of Authorization.** An authorization may be terminated by the Principal User, the RCC, or the HPO at any time. When an authorization is terminated, the Principal User will ensure that all work areas are cleared by the HPO prior to releasing them for alternate use and coordinate final disposition or transfer of all radionuclides with the Radioactive Materials Control Branch, HPO.

## Chapter 4 General Rules for the Safe Use of Radioactive Material

### 4-1. Responsibilities

a. Principal Users of radioactive materials are responsible for applying precautions listed in this chapter and ensuring their implementation by personnel listed on their Radioactive Material Authorization.

b. Principal Users of radioactive materials are responsible for maintaining a current inventory of all radioactive material on DA FORM 3862 (Controlled Substances Stock Record) or on a computer format that records the equivalent information. A complete inventory will be conducted at least every quarter and the inventory records signed and dated by the Principal User. The Health Physics Office will conduct a 100 percent joint inventory of all authorizations at least every six months.

**4-2. Laboratory Precautions.** General rules for the safe use of radioactive materials include:

a. Wear laboratory coats or other removable protective clothing at all times when actively involved in the use of unsealed radioactive material. To preclude the possible spread of contamination, only wear the laboratory coats or other protective clothing in the designated work areas.

b. Wearing of disposable gloves is encouraged at all times using unsealed radioactive materials, however, gloves are not required when:

(1) Using quantities less than 1 percent of the 10 CFR 20 Appendix C values or 10 percent of the value in Table 7-1.

(2) When handling totally encapsulated sealed sources of beta or gamma types that are exempt from leak testing requirements (see paragraph 9-5.a.).

(3) During the injection of a radiopharmaceutical when the loss of tactile sensation would hinder venipuncture technique potentially resulting in infiltrations, thereby requiring repeat studies and increasing patient exposure.

c. Monitor hands, clothing, and work areas for contamination after each procedure and before leaving the controlled area.

d. Do not eat, drink, smoke, or apply cosmetics in any area where radioactive materials are used or stored.

e. Do not store food, drink, or personal effects in areas where radioactive materials are used or stored.

f. Always wear assigned personnel dosimetry while in radioactive materials use or storage areas. Whole body dosimeters should be worn at chest or waist level. Finger or extremity dosimeters should be worn close to and facing sources handled. When not being worn, store dosimeters in the approved low-background storage location.

g. Dispose of radioactive waste only in specially designated receptacles, labeled, and if necessary shielded receptacles

h. Never pipette by mouth.

i. Confine radioactive solutions in containers plainly identified and labeled with the name of the compound, radionuclide, date, activity, and radiation level, if applicable.

j. Transport radioactive materials in appropriately shielded containers.

k. When transporting radioactive materials and waste, use carts to avoid contact with the surface of the radioactive waste container. Do not set

radioactive waste containers down in uncontrolled areas.

**4-3. Nuclear Medicine Precautions.** Additional general rules specifically applicable to preparations and use of radioactive materials for human use include:

a. Individuals who prepare a radiopharmaceutical kit shall use a syringe radiation shield when administering a radiopharmaceutical by injection unless the use of the shield is contraindicated for that patient.

b. Assay each patient dose in the dose calibrator before administration. Do not administer any doses that differ from the prescribed dose by more than 10%. Check the patient's name, identification, and prescribed radionuclide, chemical form, and dosage before administering the radionuclide.

c. Wear a finger dosimeter during elution of the generator, preparation, assay, and injection of the radiopharmaceuticals.

d. Survey the generator, kit preparation and injection areas for contamination after each procedure or at the end of the day. Decontaminate when necessary.

**4-4. Ventilation in Radiation Controlled Areas.** Procedures potentially resulting in the generation of radioactive aerosols, dusts, or gaseous products will be conducted in a hood, iodine box, dry box or other suitable closed system.

a. Radioactive gases or materials with gaseous radioactive daughters will be stored in gas-tight containers and kept in areas having approved ventilation.

b. The average velocity for hoods or gloveboxes will be 100 fpm when handling low to moderate levels of volatile radioactive materials. For highly toxic or high-level volatile radioactive material, the velocity will be 125 to 150 fpm.

**4-5. Determination of Major versus Minor Spills**

a. A spill is considered major if there is an accidental or uncontrolled release of 1 mCi or more of any radionuclide.

b. The exception to this rule is Tc-99m and Tl-201 used in the Nuclear Medicine pharmacy where a spill is considered major if 100 mCi or more is released.

c. The decision to implement a major spill procedure instead of a minor spill procedure depends on several incident specific variables. Variables to consider include;

- (1) Number of individuals affected.
- (2) Other hazards present.
- (3) Likelihood of the spread of contamination.
- (4) Types of surfaces contaminated.
- (5) Radiotoxicity of the spilled material.

d. For some short-lived radionuclides, the best spill procedure may be restricted access to the area pending complete decay of the radionuclide.

#### **4-6. Major Spills of Liquids and Solids**

a. Clear the Area. Notify all persons not involved in the spill to vacate the room.

b. Prevent the spread of contamination by covering the spill with absorbent pads, but do not attempt to clean it up. Confine the movement of all personnel potentially contaminated to prevent the spread of contamination.

c. Shield the source if possible. This should be done without further contamination or a significant increase in radiation exposure.

d. Notify the Health Physics Officer immediately.

e. Conduct limited decontamination by removing contaminated clothing and flushing contaminated skin with lukewarm water and then washing with mild soap. Do not use brushes or any other abrasive substances. Limit the spread of contamination by consolidating and keeping contaminated personnel in one location. Wait for Health Physics personnel to arrive and evaluate personnel before attempting further decontamination. Retain contaminated clothing and materials used in decontamination for further analysis by the Health Physics Office.

f. Initiate a radioactive spill report. A sample radioactive spill report is included in appendix B.

#### **4-7. Minor Spills of Liquids and Solids**

a. Notify persons in the area that a spill has occurred.

b. Prevent the spread of contamination by covering the spill with absorbent paper.

c. Clean up the spill wearing disposable gloves, remote handling tongs, and absorbent paper. Carefully fold the absorbent paper with clean side out and insert it into a plastic bag. Transfer the plastic bag to a radioactive waste container. Place other contaminated materials, such as disposable gloves, and any other contaminated disposable material into the plastic bag.

d. Survey the area with a low-range radiation detector survey meter. Check the area around the spill, hands, shoes, and clothing for contamination.

e. Report the incident to the Health Physics Officer.

f. Initiate a radioactive spill report. A sample radioactive spill report is included in appendix B.

### **Chapter 5 Personnel Monitoring**

#### **5-1. General**

a. This chapter prescribes procedures and responsibilities for monitoring and recording occupational exposures to ionizing radiation from radiation producing devices and radioactive materials.

b. Each activity receiving personnel dosimetry service from the HPO will designate a personnel dosimetry coordinator and alternate to assist the HPO in the issue, exchange, and collection of dosimetry devices.

c. Appropriate personnel monitoring devices will be assigned to each individual as required by the Health Physics Office. In addition, other personnel monitoring techniques (i.e., whole body counting or bioassay) will be utilized to evaluate personnel dosimetry as deemed necessary by the Health Physics Officer.

d. Personnel monitoring devices will be assigned when individuals could potentially receive an

occupational exposure in excess of 10% of the levels in Tables 5-1 and 5-2 for occupational exposure in a calendar year.

Stochastic Limit (TEDE) <sup>1</sup>	5 rem in 1 year
Nonstochastic Limit H <sub>d</sub> and CEDE other than eye	50 rem in 1 year
Shallow Dose Equivalent H <sub>s</sub> Skin or Extremity	50 rem in 1 year
Lens of the Eye	15 rem in 1 year

<sup>1</sup> Total Effective Dose Equivalent (TEDE) = External Exposure at a depth of 1 cm in tissue (H<sub>d</sub>), and committed effective dose equivalent (CEDE) from internal exposure

Members of the Public	0.1 rem in any one year
Dose to Embryo or Fetus <sup>1</sup>	0.5 rem in gestation period
Minors (Under 18 years of age)	10% of the annual dose limits for occupationally exposed adults

<sup>1</sup> H<sub>d</sub> to pregnant woman and dose to the embryo or fetus (after notifying the RPO in writing)

e. Application for personnel dosimetry service must be completed by the individual and submitted on DD Form 1952 (Dosimeter Application and Record of Occupational Radiation Exposure) to the HPO. The HPO will evaluate the information on the application and issue appropriate dosimetry or provide written notification that dosimetry is not needed.

f. Assignment of a personnel dosimetry device to an individual does not automatically make one a radiation worker. Occasionally exposed individuals may be monitored to determine need for permanent issue of dosimetry devices.

g. The procedures and responsibilities for processing the application are:

(1) The applicant has the responsibility to furnish:

(a) Individual identification data.

(b) Previous occupational radiation exposure history.

(2) The supervisor has the responsibility to furnish:

(a) A statement of the type of exposures in the worker's environment (i.e., x-ray, neutron, or radioactive isotopes).

(b) Complete WRAMC Form 538 indicating that the applicant has been instructed concerning the safe handling and usage of the radioactive materials listed in the authorization permit.

(c) The responsibilities and rights of an occupational radiation worker.

## 5-2. Whole Body Dosimetry

a. The thermoluminescent dosimeter (TLD) badge is the primary dosimetry device used at WRAMC.

b. A whole body badge will be worn only by the individual to whom it is issued.

c. WRAMC issued dosimeters shall not be worn by any personnel when occupationally exposed at other facilities away from their designated Government job site. However, if an individual wears a different dosimeter while working at other facility, the individual will inform the authorization holder and the Health Physics Office of the off-duty (moonlighting) dose records no later than 2 months after such records are received by the individual or 4 months following termination of such moonlighting employment, whichever is earlier.

d. Whole body dosimetry will be worn:

(1) Below the shoulders.

(2) Above the hips.

(3) Outside the clothing.

(4) On the portion or area of the body nearest the radiation source.

(5) With the dosimeter window facing out (away) from the body, and towards the radiation source.

(6) In the event a protective garment such as a lead apron is worn while working with material specifically licensed by the NRC, the dosimeter shall be worn outside any shielding.

(7) For individuals wearing lead aprons or similar protective garments while practicing medical radiology, the whole-body dosimeter shall be worn inside of any protective garment.

(8) Personnel, such as those working with medical fluoroscopic or cardiac catheterization x-ray equipment, exposed to x-rays scattered from the patient will wear a collar dosimeter and a whole body dosimeter under the protective garment.

e. When not being worn, the personal monitoring devices will be stored in the designated location approved by the RPO.

f. The department dosimetry coordinator will ensure that the dosimeters are turned in to the activity dosimetry coordinator during the designated exchange periods.

g. Personnel not directly employed by WRAMC, such as independent contractors or temporary workers, shall be issued dosimetry at the discretion of the Health Physics Office.

### **5-3. Supplemental Monitoring Devices.**

Additional personal monitoring devices will be provided when necessary to monitor a portion of the body or to obtain more immediate data. These devices will be worn only by individuals to whom they are issued.

**5-4. Care of Monitoring Devices.** When not being worn, personal monitoring devices will be stored in the place designated by the HPO and turned in to the Dosimetry Coordinator during designated exchange periods. Dosimetry devices are not to be worn during non-duty hours or when the individual is examined in medical or dental clinics.

### **5-5. Termination of Personal Dosimetry Service.**

The Principal User will notify the Health Physics Office of the departure of any department personnel who are enrolled in the personal dosimetry program.

### **5-6. Bioassay**

a. The HPO will designate individuals to participate in the bioassay program. Once so designated, individuals will participate until released, in writing, by the HPO.

b. Individual Responsibilities.

(1) Appear for the bioassay measurement at the time and place required.

(2) Provide appropriate samples for in-vitro counting.

(3) Inform the Health Physics Office of changes in working conditions or other factors that would influence the type or frequency of bioassay measurement.

### **5-7. Pregnancy Surveillance Program**

a. Declared pregnant radiation workers have lower permissible dose limits to the embryo or fetus during the course of the pregnancy. A female does not fall under the lower limits for pregnant radiation workers until she formally declares her pregnancy in writing to the RPO. A formal declaration of pregnancy is the prerogative of each female radiation worker.

b. The RPO must provide instructions regarding the prenatal exposure risks and concerns to the developing embryo or fetus. A copy of NRC Regulatory Guide 8.13 will be given to the declared pregnant radiation worker.

c. The written declaration shall be made on SF 600 (Health Record – Chronological Record of Medical Care) or locally approved form and placed in the woman's medical record.

d. Nursing mothers who are potentially exposed to the intake of radionuclides require special consideration to limit the dose to the child.

### **5-8. Records**

a. Records of an individual's radiation exposure are provided to the Health Physics Office on an Automated Dosimetry Report (ADR) by the U.S. Army Ionizing Radiation Dosimetry Center. The ADRs are reviewed by the HPO, signed by the RPO, and stored in the HPO as part of an individual's medical record. Annual reports are forwarded to the Service Chiefs or Chiefs of the research groups for review and distribution to individuals.

b. The ADR is covered by the Privacy Act. Therefore, a written authorization, signed by the individual must be forwarded to the HPO before occupational exposure information can be released to third parties.

## Chapter 6 Radiation Detection Instruments

**6-1. General.** The Health Physics Office will acquire, maintain and provide, to all activities, radiation detection instruments to meet the requirements of WRAMC's NRC licenses.

**6-2. Calibration.** The HPO will ensure that all instruments are calibrated and will maintain calibration records.

**6-3. User Responsibilities.** The User is responsible for:

- a. Security, proper use, and availability of assigned survey instruments.
- b. Performing proper operational and function checks prior to using the instrumentation. Notifying the HPO if an instrument is not functioning properly.
- c. Exchanging the survey instruments prior to the end of the calibration period

### 6-4. Survey Instrumentation

a. For high energy x-ray, beta, or gamma emitter, use a low-range thin-window G-M survey meter to survey all elution, preparation, and injection areas.

b. Perform a series of wipe tests to measure contamination levels in those areas using low energy beta emitters such as tritium or carbon-14. The method for analyzing wipe tests will be sufficiently sensitive to detect 100 dpm per 100 cm<sup>2</sup> for the contaminant involved.

c. Use a survey instrument capable of detecting dose rates as low as 0.1 mrem/hr for areas where radiopharmaceuticals are prepared for use or administered.

d. Keep a record of all survey results for three years, including negative results. The record will include:

- (1) Location, date, and type of equipment used.
- (2) Name of person conducting the survey (signature or initials).

(3) Type, serial number, and calibration date of the portable survey instruments.

(4) A drawing of the areas surveyed with contamination levels and dose rate action levels.

(5) Measured dose rates in mR/hr or contamination levels in dpm/100 cm<sup>2</sup>, as appropriate.

### 6-5. Action Levels for Restricted Areas

a. The radioisotope user will clean or decontaminate the area for Action Level I where:

- (1) Contamination exceeds 1000 dpm/100 cm<sup>2</sup>;
- (2) The radiation level is two times the background, or 1 mrem/hr at 30 cm (1 foot) for x-ray or gamma radiation.

b. The radioisotope user will clean or decontaminate the area for Action Level II and contact the Health Physics Office immediately if:

- (1) Contamination exceeds 2000 dpm/100 cm<sup>2</sup>;
- (2) The radiation levels from x-ray or gamma radiation in an unrestricted area exceeds 2 mrem/hr at 30 cm (1 foot).

**6-6. Action Levels for Unrestricted Areas.** All unrestricted areas will be maintained at a removable contamination level of less than 200 dpm/100 cm<sup>2</sup>.

### 6-7. Security of Radioactive Materials

a. The Principal User is responsible to ensure that:

- (1) Radioactive materials used within their authorization are properly secured.
- (2) Radiation hazards are properly posted.
- (3) The radioactive material is stored in a locked room, locked refrigerator, or locked container.
- (4) If the room is unlocked, and the radioactive material is not secured in a locked container, then someone must be in the room at all times.

b. If any radioactive material is believed to be missing, call the Health Physics Office **IMMEDIATELY** (within the same day that the

radioactive material is noticed missing). The Health Physics Office can then assist your laboratory in locating the radioactive material. In addition, if the quantity of material missing exceeds certain limits, the Health Physics Office may be required to notify the Nuclear Regulatory Commission within 24 hours upon discovery of the event.

## **Chapter 7 Radiation Protection Surveys**

**7-1. General.** Periodic radiation protection surveys are required in all areas where radioactive materials are used or stored. Requirements and responsibilities for these surveys at WRAMC are contained in this chapter.

### **7-2. Responsibilities**

a. The HPO is responsible for:

(1) Performing all pre-use surveys, weekly, monthly, quarterly, special and final surveys.

(2) Notifying the Principal Users of any deficiencies or radiological hazards noted during their surveys.

(3) Performing a resurvey within five (5) workdays of any areas where:

(a) Levels of removable contamination exceed Action Level II limits of 2000 dpm/100 cm<sup>2</sup>, or 2 mrem/hr at 30 cm (1 foot) for x-ray or gamma radiation.

(b) Potentially hazardous situations are noted.

b. Principal Users are responsible to:

(1) Perform daily surveys as specified in 7-3.a.

(2) Notify the HPO immediately if levels of removable contamination exceed Action Level II limits of 2000 dpm/100 cm<sup>2</sup>, or 2 mrem/hr at 30 cm (1 foot) for x-ray or gamma radiation.

(3) Notify the HPO immediately of any accidents or unusual incidents involving radioactive materials.

(4) Provide the HPO with corrective actions taken to rectify items of concern and noncompliance found during a radiation safety survey.

(5) Provide the HPO with a written request for any special surveys (i.e., pre-use, final, or equipment surveys).

(6) Ensure that a pre-use survey has been performed on all areas under their control prior to using or storing radioactive materials.

(7) Ensure that a final survey has been performed and approved in areas under their control prior to releasing the area for non-radioactive use, maintenance or modification.

(8) Request that a room be placed on administrative hold when there will be no use of radioactive material (RAM) for three or more consecutive months.

(9) Request that a room on administrative hold be reactivated at least 48 hours prior to intended use of RAM.

(10) Inform the HPO of any circumstances requiring special protective measures, i.e., chemical or biological hazards, while conducting radiation protection surveys.

### **7-3. Survey Requirements**

a. **Daily.** Daily surveys are required for all areas where radionuclides are used in quantities greater than that listed in Table 7-1. Areas where gamma, x-ray, or high energy beta emitters are used will be surveyed using a low-range, thin-window G-M survey meter. Areas where low-energy beta emitters (such as H-3, C-14, S-35) are used will be surveyed for removable contamination using swipes or smears. The daily survey will be performed by the user at the end of each day of use. Survey results will be recorded, and will include: Date of survey; building; room surveyed; highest level of contamination found; MMCN or serial number of the survey meter; survey meter calibration due date; and the surveyor. The survey log will be kept in the room and will be readily available for review.

Table 7-1 10% of 10 CFR 20 Appendix C limits for Radionuclides Commonly Used at WRAMC	
The user must conduct contamination surveys if the following activities per protocol or procedure are exceeded. <sup>1</sup>	Activity (μCi)
<sup>3</sup> H <sup>14</sup> C <sup>42</sup> K <sup>51</sup> Cr <sup>67</sup> Ga <sup>99m</sup> Tc <sup>201</sup> Tl	100
<sup>33</sup> P <sup>35</sup> S <sup>45</sup> Ca <sup>54</sup> Mn <sup>57</sup> Co <sup>85</sup> Sr <sup>86</sup> Rb <sup>99</sup> Mo <sup>95m</sup> Nb <sup>103</sup> Ru <sup>111</sup> In <sup>123</sup> I <sup>125</sup> Sb <sup>141</sup> Ce <sup>153</sup> Sm	10
<sup>22</sup> Na <sup>32</sup> P <sup>36</sup> Cl <sup>46</sup> Sc <sup>59</sup> Fe <sup>89</sup> Sr	1
<sup>109</sup> Cd <sup>125</sup> I <sup>131</sup> I	0.1

<sup>1</sup> For any radionuclide not listed, contact the HPO for the appropriate activity limit

b. No daily survey by the user is required if the activity of the isotopes used during the day is less than the activity shown in Table 7-1; however, it is always good practice to survey the work areas for contamination after using radioactive materials.

c. Weekly surveys by the Health Physics Office will be conducted if the activity of the unsealed radioactive material exceeds 200 μCi.

d. Monthly surveys by the Health Physics Office will be conducted if the activity of the unsealed radioactive material is less than 200 μCi and greater than the value in Table 7-1.

e. A quarterly radiation protection survey will be performed by the HPO staff in unrestricted areas where the HPO believes that an individual member of the public may receive an exposure to ionizing radiation. Quarterly surveys will be performed in areas where quantities do not exceed the values in Table 7-1.

f. Pre-use Survey. A pre-use survey will be performed by the HPO staff in all areas where radioactive materials will be used or stored to ensure the area meets Health Physics criteria.

g. Final Survey. A final radiation protection survey will be performed by the HPO staff in all areas (and on equipment) where radioactive materials have been used or stored prior to:

(1) Releasing the room or equipment for non-radioactive use.

(2) Releasing the room or equipment for maintenance.

(3) Moving the equipment from that location. No action may be taken until survey results are cleared by HPO.

h. Special Surveys. Special radiation protection surveys may be performed by the HPO staff at the discretion of the Health Physics Officer. Additionally, the Chief, Health Physics Office can require Principal Users to perform more frequent surveys in the event of excess contamination or noncompliance with safety procedures.

## Chapter 8 Radioactive Waste Management and Control

### 8-1. Responsibilities

a. The HPO is responsible for ensuring that all radioactive waste is managed, controlled, and disposed of according to the directives and guidelines of applicable Army, Federal, and State regulations.

b. Principal Users of radioactive materials at WRAMC are responsible for the collection and handling of radioactive waste in accordance with guidelines in paragraph 8-4., and any special instructions issued as a condition of their WRAMC Radioactive Material Authorizations.

c. The Occupational Health Section will evaluate on a routine basis, the efficiency of ventilation hoods used for temporary storage of radioactive waste.

**8-2. Policy.** 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 jurisdictions; and the guidelines delineated herein.

**8-3. General.** The below listed rules for the safe handling of radioactive materials should be followed:

- a. Wear laboratory coats or other protective clothing at all times in areas where radioactive materials are used.
- b. Wear disposable impermeable gloves at all times while handling radioactive materials.
- c. Monitor hands and clothing for contamination after each procedure or before leaving area.
- d. Do not eat, drink, smoke or apply cosmetics in any area where radioactive material is used or stored.
- e. Wear assigned personnel monitoring device(s) at all times while in areas where radioactive materials are used or stored. Whole body monitoring device(s) should be worn at chest or waist level.
- f. Dispose of radioactive waste only in specially designated receptacles.
- g. Confine radioactive solutions to covered containers, plainly identified and labeled with name of compound, radionuclide, date, activity, and radiation level, if applicable.
- h. Always transport radioactive materials in appropriately shielded containers.
- i. Wash hands after working with radioactive materials.

#### 8-4. Radioactive Waste Control in the Laboratory or Clinic

a. Principal Users are responsible for ensuring that radioactive waste is controlled in a manner that meets the safety and security measures prescribed by U.S. Army, Federal, and applicable State Regulations.

b. All Users of radioactive materials are responsible for segregating their radioactive waste into the categories listed below:

(1) Solid. Short half-life, 65 days or less plus the following radionuclides; sulfur-35 (87.44 d), cobalt-58 (70.8 d), iridium-192 (74.02 d), and scandium-46 (83.8 d).

(2) Solid. Long half-life, greater than 65 days except for the following radionuclides; sulfur-35 (87.44 d), cobalt-58 (70.8 d), iridium-192 (74.02 d), and scandium-46 (83.8 d).

- (3) Lead. Shielding materials and pigs.
  - (4) Scintillation Vials. Biodegradable (Bio-safe, etc.) scintillation fluid.
  - (5) Scintillation Vials. Organic/non-biodegradable scintillation fluid.
  - (6) Aqueous Liquids. Readily soluble (or readily dispersible biological material) in water and neutralized to  $\text{pH} > 2$  and  $\text{pH} < 12$ .
  - (7) Organic Liquids. With MSDS and approved Waste Profile Sheet for each chemical.
  - (8) Animal Carcasses/Excreta/Bedding. Short half-life.
  - (9) Animal Carcasses/Animal Waste. Long half-life.
  - (10) Animal Carcasses.  $< 0.05 \mu\text{Ci}$  H-3 or C-14 per gram of animal tissue averaged over the entire weight of the animal.
  - (11) Gas. Contact the Health Physics Office.
  - (12) Sharps. See paragraph 8-5.d.
  - (13) Stock Source Vials. See paragraph 8-9.
- c. Limit the non-radioactive waste that is intermixed with radioactive waste to an absolute minimum.

d. Remove or obliterate 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.

e. Store used Mo-99/Tc-99m generators and other equipment containing radioactive material in designated areas only. The radiation labels will be removed on such items only when they have reached levels indistinguishable from background and have been cleared by the HPO.

f. Maintain on-hand inventories of radioactive waste to a practical minimum.

g. Control radioactive waste in work areas to prevent unauthorized disposal by the custodial service. Properly labeled waste containers will be used for radioactive waste. Labeled radioactive waste containers will not be used for other purposes.

h. Ensure that all radioactive waste is delivered to HPO collection point personnel for ultimate disposal.

i. Mark all radioactive waste containers (receptacles) with the radiation caution symbol and the words "Caution - Radioactive Waste" or "Caution - Radioactive Material" and "DO NOT EMPTY!".

j. Ensure that radioactive material is not released into the sanitary sewage system without the specific approval of HPO.

k. Ensure that decontamination of reusable equipment is performed in laboratory sinks that have been authorized for that purpose. See paragraph 8-6. for specific requirements concerning this procedure.

l. Radioactive waste that is infectious waste must be properly disinfected before it is given to the HPO for disposal. **INFECTIOUS WASTE WILL NOT BE GIVEN TO HPO.**

#### 8-5. Packaging Radioactive Waste for Disposal

a. Solid radioactive waste will be placed in plastic bags or a container lined with plastic bags. Only clear bags at least 4 mils thick will be used. Clear bags will allow visual inspection of the waste by HPO personnel at the time of turnin. Bags will be taped closed and tagged with a radiation tag containing the authorization number, radioisotope(s), and activity.

b. Bulk liquid waste retained for disposal shall be collected in plastic bottles or sealed in cans to diminish breakage. Liquid waste that will chemically react with plastic should be placed in glass bottles. The containers will be tagged as stated in paragraph 8-5.a.

c. Scintillation vials will be packaged separately from other materials. They will be tightly closed and placed in a shipping tray that is labeled with the words "Caution - Radioactive Material." Care must be taken to prevent breakage of the vials while in

storage or transport. The trays will be tagged as stated in paragraph 8-5.a.

d. All "Sharps" to include syringes with needles, needles and similar items must be separated from other radioactive waste, packaged in cardboard boxes or sharps containers and sealed to prevent personal injury. The sharps containers and boxes will be tagged as stated in paragraph 8-5.a. All sharps containers with long half-life waste may contain only minimal, residual liquid.

e. Short half-life materials and items contaminated with short half-life materials will be separated from other materials. Radioactive warning labels must be obliterated on all vials and materials prior to placing the items in the plastic bags. The bags will be tagged identifying isotope(s), activity, and authorization number. Do not use "radiation tape" to seals these bags.

f. Biological wastes (animal carcasses/animal waste) will be prepared by the user in a manner that allows the waste to be readily packaged in alternating 10-inch layers of waste and packing materials. Prepared biological waste will be placed in 4 mil clear bags and tagged as previously indicated.

#### 8-6. Release of Radioactive Material into the Sanitary Sewage System

a. Liquid radioactive waste will not be released into the sanitary sewage system unless prior approval has been included in the WRAMC Radioactive Material Authorization.

b. Other conditions for the disposal of liquid radioactive waste material (as a byproduct of washing laboratory glassware or equipment) into the sewage system are:

(1) The total quantity of material released by the user in any one month will not exceed 100  $\mu$ Ci. Assume emptied glassware retains one percent of the radioactivity originally contained within the glassware.

(2) The sink must be conspicuously posted with a sign bearing the Radioactive Caution Symbol and words, "Caution - Radioactive Material Wash Sink", and with a notice to the user that radioactive material discharged through the sink must be readily soluble or dispersible in water.

(3) A record of the identity and activity of radionuclides released will be maintained by the Principal User. This record will be reviewed by HPO for compliance with regulatory limits.

#### **8-7. Collection, Local Transportation and Storage of Radioactive Waste**

a. Properly packaged radioactive waste will be brought to centralized collection points in building 40, building 503, building 2, or other designated locations. Under the supervision of the HPO, waste will be placed in barrels or other designated containers. Waste that has not been properly separated and tagged will not be accepted.

b. Principal Users will ensure that packaged radioactive waste brought to the collection points is supervised until accepted by HPO to preclude the possibility of loss or theft.

c. All radioactive waste (except mixed waste which contains a percentage of EPA regulated material) will be transported from the above noted collection points to the Radioactive Material Storage Areas located in Building 516, Forest Glen Section, WRAMC, for ultimate disposal.

d. Building 516, may be used to store all categories of radioactive waste.

e. Storage areas are considered "Restricted Areas" and will remain locked to preclude the possibility of loss or theft and protect individuals from exposure to radiation or radioactive materials.

f. Radioactive Material Storage Areas will be posted by Health Physics personnel with the appropriate warning signs prescribed by Title 10 CFR 20.1902.

g. Wastes will be packaged for ultimate shipment and disposal in accordance with the instructions furnished by the waste disposal contractor. The waste disposal contractor is determined by DOD Executive Agency for Low-Level Radioactive Waste, ATTN: AMSIO-DMW, Rock Island, IL 61299 in accordance with AR 385-11.

#### **8-8. Radioactive Waste Disposal Supplies**

a. Items of supply used for radioactive waste packaging are stocked by the Supply and Administration Branch, Material Division, Directorate of Logistics, WRAMC. All stockage

items meet Federal radioactive material packaging requirements for most types of the radioactive waste resulting from laboratory and/or clinical procedures at WRAMC.

b. Personnel involved with packaging of hazardous chemical radioactive waste will consult the HPO to ensure that the stockage items meet packaging requirements.

c. Principal Users are responsible for funding for materials and supplies used to dispose of radioactive waste. The HPO will order supplies needed to collect and package the waste received at collection points and will cite Clinical Investigation, Department of Pathology/Laboratory Services, Department of Radiology, AFIP, or WRAIR as appropriate. All supply orders submitted by HPO will be prorated to the using services.

#### **8-9. Disposal of Stock Source Vials**

a. All original stock source vials, whether depleted, decayed, or partially used will be turned over to the Health Physics personnel along with the radiation waste.

b. A stock source vial is defined as having an initial activity of at least 50  $\mu\text{Ci}$  of any radionuclide.

c. Original stock source vials, whether depleted or not, which are turned in as waste shall be kept separate from other waste.

d. When source vials are turned in to Health Physics, please provide the source HPO identification number (Yellow Tag Number).

e. If there are multiple vials listed under the same identification number, list the vials still in your possession.

f. The inventory log will be adjusted to show the change in the authorization inventory. Health Physics personnel will sign the inventory log if provided at the time of turn-in. In addition, Health Physics personnel will provide a signed receipt for possession of the source vial(s).

### **Chapter 9**

#### **Sealed Source Leak Testing and Accountability**

### 9-1. Responsibilities

a. The HPO is responsible for ensuring and documenting that all sealed sources are acquired, inventoried, leak tested, transferred and disposed of in accordance with applicable requirements.

b. Principal Users are responsible for ensuring and documenting that all sealed sources used to support their operation are specifically permitted by their WRAMC Radioactive Material Authorization and that each source is acquired, inventoried, transferred and disposed of in accordance with the requirements of this chapter.

**9-2. Acquisition of Sealed Sources.** Regardless of activity or intended use, the acquisition of each sealed source will be cleared with the HPO prior to any commitment for purchase or receipt. The HPO will determine which Federal regulatory requirements apply to acquisition of the sealed source and provide prospective suppliers with any required certification/NRC license documents.

**9-3. Inventory of Sealed Sources.** A current inventory of all sealed sources will be maintained by the HPO.

a. Each accountable sealed source at WRAMC will be assigned a Health Physics control number by the HPO.

b. Each nonexempt sealed source will be inventoried quarterly and a record maintained by the HPO.

c. The Principle Users shall notify the HPO of any change in location of sealed sources under their control.

**9-4. Transfer and Disposal of Sealed Sources.** The transfer and disposal of all sealed sources will be coordinated with the HPO.

a. Individual sealed sources will be transferred only to authorized recipients or licensed disposal sites.

b. When items of equipment containing sealed sources are to be transferred or disposed of, the HPO will be notified. After performing a final survey to determine that all sealed sources have been removed, all radioactive warning labels have been obliterated, and the item is free of radioactive contamination, the HPO will provide written certification that the item

does not present a radiation hazard and may be disposed of through normal channels.

### 9-5. Leak Testing of Sealed Sources

a. Leak Test Requirements.

(1) Each sealed source with a half-life greater than thirty days and in any form other than gas will be tested for contamination or leakage by the vendor or the HPO before use.

(2) Sealed sources designed to emit alpha particles will be leak tested at intervals not to exceed three months. All other sealed sources containing byproduct material will be leak tested at intervals not to exceed six months. These leak tests will be performed by the HPO.

(3) Sealed sources that contain 100 microcuries or less of beta or gamma emitting material or 10 microcuries or less of alpha emitting material are exempt from such leak tests.

(4) Sealed sources containing only byproduct material with a half-life of less than thirty days or byproduct material as a gas is also exempt from leak tests.

(5) Sealed sources are exempt from six-month periodic testing if they are stored and not being used; however, these sources will be leak tested prior to any use or transfer if testing has not been done within the past six months.

(6) If there is reason to suspect a sealed source has been damaged it will be tested for leakage before further use.

b. Any sealed source with a positive leak test (greater than 0.005 microcuries) will be immediately withdrawn from use by the HPO. The HPO will retest to determine whether or not the source is leaking. If it is leaking, it will be resealed or disposed of in accordance with existing regulations.

c. WRAMC Form 1685 (Sealed Source Inventory and Leak Test Record), or its equivalent, will be used by the HPO to record leak test results. Consecutive entries will be made for each test including: The date, activity detected in microcuries, and the initials of the person performing the test.

## Chapter 10 Health Physics Aspects of Patient Care

### 10-1. General Requirements

a. It is the responsibility of all personnel who are occupationally exposed to radiation from patients receiving radiotherapy to:

(1) Properly utilize the dosimetry issued to them.

(2) Know and conform to the radiation protection and emergency measures pertaining to their procedures.

b. Radiation safety procedures will not impede emergency medical care, however, a maximum effort will be made to minimize the exposure of individuals performing the treatment.

### 10-2. Responsibilities

a. The physician performing the therapy procedure will:

(1) Notify the HPO one week prior to the scheduled procedure date (emergency procedures as early as possible) and provide the following information:

(a) Patient's name.

(b) The date and time the procedure will be initiated.

(c) Type and approximate length of the procedure.

(d) Isotope activity.

(e) The location (treatment room, operating room, or ward room) where the radioactive material will be administered to the patient.

(f) The room and ward to which the patient will be assigned for the duration of the procedure.

(2) Ensure that there is a sufficient availability of personnel (i.e., nursing, health physics) and equipment to support the therapy.

(3) Ensure that the patient is not released without proper HPO clearance.

b. The service performing the procedure, Radiation Therapy, Radiation Oncology, or Nuclear Medicine will ensure that the physician performing the procedure is listed on the appropriate Human Use Authorization which covers the procedure and has been authorized by the RCC.

c. The HPO will:

(1) Establish radiation protection and emergency procedures for each type of therapy.

(2) Brief all personnel (especially the nursing staff) on the radiation protection and emergency procedures associated with that therapy.

(3) Determine, based on the information provided by the physician:

(a) The personnel dosimetry requirements.

(b) The radiation shielding required for the procedure.

(c) When HPO coverage will be required.

(d) Any special radiation protection and emergency procedures required.

(4) Brief the patient on Health Physics aspects of the procedure.

(5) Ensure that the appropriate dosimetry has been issued and is being utilized correctly.

(6) Prepare the room where the radioactive material will be introduced into the patient and where the patient will be located during the procedure to minimize and/or prevent the spread of contamination.

(7) Monitor the dosing of the patient to ensure that the radiation protection procedures are followed.

(8) Post the appropriate forms, signs and labels.

(9) Make periodic visits to the ward throughout the duration of the procedure. The frequency of the visits will be determined by the HPO.

(10) Ensure that all radioactive materials removed from the ward are either returned to storage or disposed of in the appropriate container.

(11) Determine, based upon measurements and regulatory requirements, when the patient will be

released from the restrictions required for radiation protection.

(12) Remove all forms, signs and labels at the end of the procedure.

(13) Release the room for general use at the earliest possible time consistent with radiation protection considerations with the exception of dedicated rooms.

d. The nursing staff and ward personnel will:

(1) Comply with radiation protection procedures.

(2) Notify the Health Physics Technician on call for the therapy and the Radiation Oncologist or Nuclear Medicine Physician in the event of patient emergencies, death, or unusual situations as outlined in radiation protection briefings.

e. Chief, Endocrinology Service. Ensure proper notification of nuclear medicine, Kyle Metabolic Unit, and HPO of scheduled ablation therapies to ensure proper and timely preparation.

**10-3. Emergency Notification.** In the event of an emergency or misadministration, notify the Health Physics Office at (202) 356-0058.

## **Chapter 11 Animals Containing Radioactive Material**

### **11-1. Responsibilities**

a. The Principal User is responsible to:

(1) Ensure that animals containing radioactive materials are housed only in cages labeled as containing radioactive material. The labels on the cages will indicate the radioisotope, millicurie amount, and date the radioisotope was introduced into each animal.

(2) Ensure that the cages containing radioactive animals are housed only in rooms that have been approved and posted by the HPO.

(3) Ensure the HPO and the Director of Department of Laboratory Animals, Walter Reed Army Institute of Research (WRAIR), are notified prior to the commencement or change in procedure of

all projects where radioactive materials are introduced into laboratory animals.

(4) Notify the HPO and the Director of Department of Laboratory Animals, WRAIR, at the termination of studies. Rooms or cages must be cleared and unposted by the HPO prior to release for unrestricted use.

(5) Remove all radioactive materials from rooms used exclusively to house animals.

(6) Ensure that all applicable radiation protection procedures are met.

(7) Notify the HPO of any unusual occurrences or incidents in which radioactive material is involved.

b. The HPO is responsible to:

(1) Ensure that rooms and cages used to perform procedures and house animals are properly posted and labeled.

(2) Inform the Principal User and the animal handlers of any special radiation protection procedures to be observed.

## **Chapter 12 X-Ray Producing Devices**

### **12-1. Requirements**

a. An initial design review or survey of the facility will be made including protective barriers, interlocks, and other associated protective devices of newly procured equipment.

b. An initial radiation protection survey will be performed prior to the routine use of any newly installed, modified, or relocated equipment.

c. All x-ray producing devices intended for human-use will have a radiation survey at least annually by the HPO.

d. All x-ray producing devices not intended for human-use will have a radiation survey at least triennially by the HPO.

e. A resurvey will be performed after every change in equipment, subsystem, component, workload, or operating conditions that might

significantly increase the exposure of patients or operating personnel to ionizing radiation.

## 12-2. Responsibilities

a. The using organization is responsible to:

(1) Ensure that a shielding evaluation is performed prior to the procurement, installation, modification, or relocation of any x-ray producing equipment or facility.

(2) Ensure that a radiation protection survey is performed after acceptance testing and prior to the use of any newly installed, modified, or relocated, x-ray producing equipment or facility.

(3) Notify the HPO of any change in equipment, subsystem, component, workload, or operating conditions.

(4) Report the location of all x-ray producing devices to the HPO.

(5) Collect portable x-ray equipment and make them available in a central location for surveying.

(6) Ensure that written procedures are established to provide radiation protection and emergency procedures for each facility.

(7) Keep exposures of patients or operating personnel to ionizing radiation as low as reasonable achievable.

(8) Ensure that only fully qualified personnel operate the equipment.

(9) If requested, provide an operator for the system during the radiation protection survey.

(10) Maintain a Quality Assurance program.

(11) Notify the HPO of any pregnant patients receiving medical radiation exposure.

(12) Conduct safety defect testing of lead aprons, thyroid collars, lead drapes, and gonadal shields at least annually.

b. Biomedical Electronics, Maintenance Division is responsible to:

(1) Provide written notification to the HPO of all corrections of deficiencies noted on survey reports.

(2) Notify the HPO of any changes in equipment, subsystem, component, or operating conditions.

(3) Provide a semiannual listing to the HPO of all x-ray equipment maintained, serviced, or vendor supported.

c. The HPO is responsible to:

(1) Maintain a registry of all x-ray producing devices within the Walter Reed Army Health Care System.

(2) Perform all radiation protection and compliance surveys, resurveys, and initial radiation protection analyses.

(3) Ensure that only qualified personnel perform radiation protection and compliance surveys.

(4) Conduct fetal dose estimates for pregnant patients receiving medical irradiation.

(5) Calculate and provide patient entrance skin exposures for x-ray systems.

(6) Perform an initial design review or survey of the facility including protective barriers, interlocks, and other associated protective devices of newly procured equipment.

## Chapter 13

### Non-Ionizing Radiation Sources

**13-1. Purpose.** This chapter outlines the non-ionizing radiation safety program for WRAMC and its tenant facilities. The responsibility for implementing and enforcing the non-ionizing radiation safety program rests with the Chief, HPO, WRAMC. To be successful, however, the program must be carried out as a joint venture with the Occupational Health Clinic and the Industrial Hygiene Section of the WRAMC Preventive Medicine Service, the WRAMC Safety Office, as well as the departments and activities that use non-ionizing radiation sources.

**13-2. Applicability.** The table located at the end of this chapter lists the individual program elements in

the WRAMC non-ionizing radiation protection program and indicates which elements are required for the various types of non-ionizing sources based upon their relative hazards.

### 13-3. Responsibilities

#### a. The Chief, HPO, WRAMC:

(1) Review requests for the procurement of equipment which uses or produces microwave or radio frequency radiation, laser radiation, ultrasound, and other high intensity optical radiation, hereafter collectively referred to as non-ionizing radiation.

(2) Maintain an inventory of non-ionizing radiation sources. Submit a copy of the inventory to the Industrial Hygiene Section for inclusion in the Health Hazards Information Module (HHIM) data base. Update the data base as necessary. Coordinate with the Occupational Health Clinic to ensure proper use of the inventory in the Occupational Vision Program.

(3) Ensure that users of non-ionizing radiation equipment and maintenance personnel develop Standing Operating Procedures (SOP). Ensure that users post these SOPs at visible locations in the user/maintenance facilities and that they strictly enforce SOP provisions. Maintain copies of SOPs and ensure users update them as necessary.

(4) Ensure users provide or contract for initial non-ionizing radiation safety training for all users and maintenance personnel.

(5) Coordinate with the U.S. Army Center for Health Promotion and Preventive Medicine for non-ionizing radiation safety surveys.

(6) Notify the Radiological Hygiene Consultants to MEDCOM and to the Office of the Surgeon General within 24 hours of any incident involving non-ionizing radiation sources.

b. Chief, Occupational Health Clinic will routinely review the HHIM database and coordinate with the HPO, and the Industrial Hygiene Section to screen individuals working with non-ionizing radiation for inclusion in the Occupational Vision Program.

c. Chief, Industrial Hygiene Section will coordinate with the HPO to enter non-ionizing

radiation source inventories into the HHIM data base and notify the Occupational Health Clinic of these sources.

d. Department heads and activity chiefs who are responsible for the operation of non-ionizing radiation equipment will:

(1) Provide the HPO with the type, model, serial number, maintenance management control number, and location of their non-ionizing radiation equipment.

(2) Receive HPO's review and approval prior to procuring new non-ionizing radiation equipment or modifying existing equipment.

(3) Notify the HPO prior to the relocation or disposal of non-ionizing radiation equipment.

(4) Develop SOPs for the safe use of non-ionizing radiation equipment and submit copies to the HPO. Ensure that they post SOPs at visible locations and strictly enforce SOP provisions.

(5) Coordinate with the HPO to develop a training program for non-ionizing radiation safety. Ensure that all users in the department or activity receive annual training and provide the HPO with training documentation.

(6) Ensure proper maintenance and calibration of non-ionizing radiation sources as required by the manufacturer.

(7) Ensure individuals selected for inclusion in the Occupational Vision Program receive appropriate testing at the Occupational Health Clinic.

(8) Notify the HPO immediately following an incident or suspected incident involving non-ionizing radiation sources to include proper documentation of all background information.

e. Supervisors of personnel responsible for the maintenance of non-ionizing radiation equipment will:

(1) Develop SOPs outlining radiation safety procedures used during the maintenance of non-ionizing radiation equipment and provide copies of the SOPs to the HPO.

(2) Ensure that all maintenance personnel working with non-ionizing radiation sources receive initial safety training and provide training records to the HPO.

(3) Notify department/activity chiefs of suspected incidents involving non-ionizing radiation sources.

(2) Characteristic X-rays: From the interaction of either electrons or ions on matter.

(3) Prompt gamma radiation: From the interaction of either ions or neutrons on matter.

(4) Neutron radiation: From the interaction of either electrons, photons, or ions on matter.

(5) Delayed radiations (beta and gamma rays): From induced radioactivity. There may be several sources of radiation throughout an accelerator, depending on its design and operating condition. Of particular importance at higher particle energies is the significant amount of induced radioactivity.

**Table 13-1  
Non-Ionizing Radiation Protection Program Requirements**

Program Element	Microwave Sources	Laser Sources	High Intensity Optical Sources	UV Sources
HPO Approval for Procurement	All except ovens	Class IIIb and IV	All	All
Source Inventory	All except ovens	Class IIIb and IV	All	All
Hazard Training	Power Density > PEL <sup>1</sup>	Class IIIb and IV	Intensity > MPE <sup>2</sup>	Irradiance > TLV <sup>3</sup>
Area Posting Requirement	Power Density > PEL	Class IIIb and IV	Intensity > MPE	Irradiance > TLV
Ocular Surveillance	All except ovens	Class IIIb and IV	All	All
SOPs	Power Density > PEL	Class IIIb and IV	Intensity > MPE	Irradiance > TLV
Protective Equipment	Not Applicable	Class IIIb and IV	Intensity > MPE	Irradiance > TLV
Facility Surveys	Power Density > PEL	Class IIIb and IV	Intensity > MPE	Irradiance > TLV
HPO Disposal Notification	All except ovens	Class IIIb and IV	All	All

<sup>1</sup> Permissible Exposure Limit.

<sup>2</sup> Maximum Permissible Exposure.

<sup>3</sup> Threshold Limit Value.

**b. Radiation Equipment and Safety Systems.**

**(1) Interlocks.**

(a) Personnel entrances into any high-radiation area shall be provided with either a door or shielding equivalent to that of the surrounding walls.

(b) All personnel access barriers will be equipped with interlock switches that cause the production of radiation by the accelerator to stop if the access barrier is opened. Interlocks shall also be provided to protect personnel from electrical hazards such as high-voltage power supplies and linear-accelerator modulators. All interlocks shall be tested and inspected periodically to ensure that they are functioning as designed.

(c) Certain accelerators for radiotherapy can be alternatively used to deliver electron or x-rays to a patient. These shall be provided with a suitable interlock system to prevent inadvertent exposure of the patient to electrons when x-ray exposure is intended. The electron-beam current will be limited to values consistent with electron-beam therapy.

(d) Emergency switches to stop the production of radiation shall be placed conspicuously in high-radiation areas so that personnel within such areas can have ready access to them in the event they are inadvertently caught within the area. The emergency switches shall be part of the interlock system and conspicuously marked as to their function.

(e) Warning signs will be posted and radiation-warning lights shall be designed into the fail safe circuit so that if the light has burned out, no radiation will be produced. The warning signs and lights will

**Chapter 14  
Particle Accelerators**

**14-1. Purpose.** This chapter outlines the radiation safety program for WRAMC and its tenant facilities for particle accelerators. All individuals associated with the operation of a therapeutic radiation machine shall be instructed in and shall comply with the provisions of the registrant's quality management program.

**14-2. General**

a. Sources and types of radiations from accelerators:

(1) X-rays (bremsstrahlung): Form the interaction of electrons on matter.

be inspected and tested periodically to ensure they are functioning as intended.

(f) Airborne radioactivity may be produced by x-rays from accelerators above 6 MeV, and by all neutron-producing accelerators. The air vented from areas in which airborne radioactivity is suspected shall be dispersed into the atmosphere in a manner to meet existing local, state, and federal regulations.

(g) Induced radioactivity of accelerator components such as cyclotron dee structures, collimating slits, magnet chambers, or beam dumps needs to be considered with respect to possibly limiting access to radioactivity areas until the radioactivity has reached safe levels. Induced radioactivity of accelerator components needs to be considered for safe handling, storage, and transportation or the affected components.

(h) No individual, other than the patient, shall be in the treatment room during treatment or during any irradiation for testing or calibration purposes.

#### 14-3. Responsibilities

a. All physicians, physicists, dosimetrists, and therapists assigned to Radiation Oncology Division are classified as radiation workers.

b. The Radiation Oncology Physicist shall:

(1) Perform Quality Control measures in accordance with TB MED 521.

(2) Perform weekly chart review of every patient under treatment.

(3) Maintain calibration of instrumentation, and periodically evaluate equipment function.

(4) Ensure appropriate treatment unit safety and warm-up inspections are performed.

(5) Supervise physical aspects of treatment planning.

(6) Supervise and review the dosimetry plans for the patient.

(7) Assist the dosimetrist in all aspects of treatment planning. Check the accuracy of the treatment plans before any treatment is delivered.

(8) Equipment calibrations.

(a) Spot checks shall be performed during full calibrations and at intervals not exceeding a month thereafter. A memorandum indicating the checks conducted and date performed shall be provided to the Health Physics Office no later than 2 weeks after performing the survey.

(b) Computer codes shall be verified by phantom dose calculations and in comparison to other calculations before being employed in treatment planning.

(9) Physics.

(a) Weekly check the outputs of all treatment beams.

(b) An independent qualified physicist shall check the output of the clinic units within 30 days of the full calibration.

(10) Radiation Safety.

(a) Perform an area survey of the adjoining spaces.

(b) Ensure HPO is notified in the event of any incidents, accidents, recordable events, or misadministrations.

c. The Health Physics Office shall:

(1) Maintain the individual dosimetry records.

(2) Provide calibrated area monitors and survey meters.

d. The RCC shall approve authorized users.

**14-4. Emergency Notification.** In the event of an emergency or misadministration, notify the Health Physics Office at (202) 356-0058.

**Appendix A  
References**

1. AR 11-9, 29 June 1999, The Army Radiation Safety Program.
2. AR 40-3, 15 February 1985, Medical, Dental, and Veterinary Care.
3. AR 40-5, 15 October 1990, Preventive Medicine.
4. AR 40-13, Medical Support-Nuclear/Chemical Accidents and Incidents.
5. AR 40-14, 30 June 1995, Occupational Ionizing Radiation Personnel Dosimetry.
6. AR 40-46, 15 November 1978, Control of Health Hazards from Laser and High Intensity Optical Sources.
7. AR 40-61, 25 January 1995, Medical Logistics Policies and Procedures.
8. AR 40-66, Medical Record and Quality Assurance Administration.
9. AR 385-10, Army Safety Program.
10. AR 385-11, 1 May 1980, Ionizing Radiation Protection (Licensing, Control, Transportation, Disposal, and Radiation Safety).
11. AR 385-30, 18 November 1971, Safety Color Code Markings and Signs.
12. AR 385-40, 1 November 1994, Accident Reporting and Records.
13. AR 750-43, 28 November 1997, Army Test, Measurement, Diagnostic Equipment Program.
14. DOD 4500.9-R (Part II), Defense Transportation Regulation - Cargo Movement.
15. DODI 6055.1, DoD Occupational Safety and Health Program..
16. DA PAM 40-18, 30 June 1995, Personnel Dosimetry Guidance and Dose Recording Procedures for Personnel Occupationally Exposed to Ionizing Radiation.
17. TB MED 521, 15 June 1981, Management and Control of Diagnostic X-Ray, Therapeutic X-Ray, and Gamma Beam Equipment.
18. TB MED 522, August 1980, Occupational and Environmental Health Control of Health Hazards from Protective Material Used in Self-Luminous Devices.
19. TB MED 523, 15 July 1980, Control of Hazards to Health from Microwave and Radiofrequency Radiation and Ultrasound.
20. TB MED 524, 1 June 1985, Control of Hazards to Health from Laser Radiation.
21. TB MED 525, March 1988, Control of Hazards to Health From Ionizing Radiation Used by the Army Medical Department.
22. SB 11-206, Personnel Dosimetry Supply and Service for Technical Radiation Exposure Control.
23. American National Standards Institute C95.1-1974, Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields.
24. American National Standards Institute C95.2-1974, Safety Level of Electromagnetic Radiation with Respect to Personnel.
25. American National Standards Institute C95.3-1973, Techniques and Instrumentation for the Measurement of Potentially Hazardous Electromagnetic Radiation at Microwave Frequencies.
26. American National Standards Institute Z136.1-1993, Safe Use of Lasers.
27. American National Standards Institute Z136.3-1996, Safe Use of Lasers in Health Facilities.
28. Title 3, Code of Federal Regulations, 3195-01, Presidential Directive, Radiation Protection Guidance to Federal Agencies for Diagnostic X-Rays.
29. Title 10, Code of Federal Regulations, Part 19, Notices, Instructions, and Reports to Workers; Inspections.
30. Title 10, Code of Federal Regulations, Part 20, Standards for Protection Against Radiation.

31. Title 10, Code of Federal Regulations, Part 21, Reporting of Defects and Noncompliance.
32. Title 10, Code of Federal Regulations, Part 33, Licenses for Radiography and Radiation Safety Requirements for Radiographic Operations.
33. Title 10, Code of Federal Regulations, Part 34, Licenses for Radiography and Radiation Safety Requirements for Radiographic Operations.
34. Title 10, Code of Federal Regulations, Part 35, Medical Use of Byproduct Material.
35. Title 21, Code of Federal Regulations, Part 1020, Performance Standards For Ionizing Radiation Emitting Products.
36. Title 21, Code of Federal Regulations, Chapter 1, Subchapter J.
37. Title 29, Code of Federal Regulations, Part 1910, Occupational Safety and Health Standards
38. Title 40, Code of Federal Regulations, Part 61, National Emission Standards for Hazardous Air Pollutants
39. NUREG 0267, Principles and Practices for Keeping Occupational Radiation Exposures at Medical Institutions as Low as Reasonably Achievable.
40. NRC Inspection and Enforcement Information Notice No. 82-33, Control of Radiation Levels in Unrestricted Areas Adjacent to Brachytherapy Patients.
41. NRC Regulatory Guide 8.1, Radiation Symbol.
42. NRC Regulatory Guide 8.2, Guide for Administrative Practices in Radiation Monitoring.
43. NRC Regulatory Guide 8.6, Standard Test Procedure for Geiger-Muller Counters.
44. NRC Regulatory Guide 8.7, Occupational Radiation Exposure Records Systems.
45. NRC Regulatory Guide 8.9, Acceptable Concepts, Models, Equations, and Assumptions for a Bioassay Program.
46. NRC Regulatory Guide 8.10, Revision 1-R, Operating Philosophy for Maintaining Occupational Radiation Exposures As Low As Is Reasonably Achievable.
47. NRC Regulatory Guide 8.13, Revision 2, Instruction Concerning Prenatal Radiation Exposure.
48. NRC Regulatory Guide 8.15, Acceptable Programs for Respiratory Protection.
49. NRC Regulatory Guide 8.18, Revision 1, Information Relevant to Ensuring that Occupational Radiation Exposures at Medical Institutions will be As Low As Reasonably Achievable (ALARA).
50. NRC Regulatory Guide 8.20, Revision 1, Applications of Bioassay for I-125 and I-131.
51. NRC Regulatory Guide 8.23, Radiation Safety Surveys at Medical Institutions.
52. NRC Regulatory Guide 8.25, Revision 1, Air Sampling in the Workplace.
53. NRC Regulatory Guide 8.29, Instruction Concerning Risks From Occupational Exposure.
54. NRC Regulatory Guide 8.32, Criteria for Establishing a Tritium Bioassay Program.
55. NRC Regulatory Guide 8.34, Monitoring Criteria and Methods to Calculate Occupational Radiation Doses.
56. NRC Regulatory Guide 8.35, Planned Special Exposures.
57. NRC Regulatory Guide 8.36, Radiation Dose to the Embryo/Fetus.
58. NRC Regulatory Guide 10.8, Revision 2, Guide for the Preparation of Applications for Medical Use Programs.
59. NRC Regulatory Guide 10.9, Guide for the Preparation of Applications for Licenses for the Use of Gamma Irradiators.
60. National Council on Radiation Protection and Measurements Report No. 35, 9 March 1970, Dental X-Ray Protection.

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61. National Council on Radiation Protection and Measurements Report No. 37, Precautions in the Management of Patients Who Have Received Therapeutic Amounts of Radionuclides (1970).
62. National Council on Radiation Protection and Measurements Report No. 38, Protection Against Neutron Radiation.
63. National Council on Radiation Protection and Measurements Report No. 39, Basic Radiation Protection Criteria.
64. National Council on Radiation Protection and Measurements Report No. 49, 15 September 1976, Structural Shielding Design and Evaluation for Medical Use of X Rays and Gamma Rays of Energies Up to 10 MeV.
65. National Council on Radiation Protection and Measurements Report No. 53, Review of NCRP Radiation Dose Limits for Embryo and Fetus in Occupationally-Exposed Women.
66. National Council on Radiation Protection and Measurements Report No. 57, 1 May 1978, Instrumentation and Monitoring Methods for Radiation Protection.
67. National Council on Radiation Protection and Measurements Report No. 58, 1 February 1985, A Handbook of Radioactivity Measurements Procedures.
68. National Council on Radiation Protection and Measurements Report No. 96, Comparative Carcinogenicity of Ionizing Radiation and Chemicals.
69. National Council on Radiation Protection and Measurements Report No. 102, 30 June 1989, Medical X-Ray, Electron Beam and Gamma-Ray Protection for Energies Up to 50 MeV.
70. National Council on Radiation Protection and Measurements Report No. 105, Radiation Protection for Medical and Allied Health Personnel.
71. National Council on Radiation Protection and Measurements Report No. 107, Implementation of the Principle of the Principle As Low As Reasonably Achievable for Medical and Dental Personnel.
72. National Council on Radiation Protection and Measurements Report No. 114, Maintaining Radiation Protection Records.
73. National Council on Radiation Protection and Measurements Report No. 116, Limitation of Exposure to Ionizing Radiation.
74. National Council on Radiation Protection and Measurements Report No. 124, 11 March 1996, Sources and Magnitude of Occupational and Public Exposures from Nuclear Medicine Procedures.
75. National Council on Radiation Protection and Measurements Report No. 127, 12 June 1998, Operational Radiation Safety Program.
76. WRAMC Reg 40-92, 1 July 1993, Patient Care Committees, Boards and Councils.
77. USAEHA TG 153, Guidelines for Controlling Potential Health Hazards from Radiofrequency Radiation (April 1987).
78. Memorandum, AMC Safety Office, AMCSF-P, 15 February 1996, subject: Approval of Department of the Army Radiation Authorizations and Department of the Army Radiation Permits (DARAs/DARPs).

# Radioactive Spill Report

Contact the Health Physics Office immediately after any spill at (202) 356-0058/59

Authorization Number: \_\_\_\_\_ Date of the Report: \_\_\_\_\_

Building Number: \_\_\_\_\_ Room Number: \_\_\_\_\_ Location: \_\_\_\_\_

The spill date: \_\_\_\_\_ and the time of the spill: \_\_\_\_\_

Give a brief description of the accident:

Instrument used to check for decontamination: \_\_\_\_\_

Meter Model No.: \_\_\_\_\_ Serial No.: \_\_\_\_\_ Calibration Due Date: \_\_\_\_\_

Personnel Present	Personnel Contamination Results <sup>1</sup>

<sup>1</sup> On the back of this sheet, indicate any personnel decontamination, additional monitoring, or precautions taken

Survey the spill area to identify any hot spots and begin decontamination. Conduct a post-decontamination wipe test.

Radioisotopes present or suspected in the spill:

\_\_\_\_\_ mCi of \_\_\_\_\_ as \_\_\_\_\_

\_\_\_\_\_ mCi of \_\_\_\_\_ as \_\_\_\_\_

\_\_\_\_\_ mCi of \_\_\_\_\_ as \_\_\_\_\_

Give a brief description of the follow-up actions taken to prevent reoccurrence:

\_\_\_\_\_

The person submitting the report: \_\_\_\_\_

PRINT NAME

SIGNATURE



**GLOSSARY****Activity**

The rate of disintegration (transformation) or decay of radioactive material. The units of activity are curie (Ci) and becquerel (Bq). 1 Ci =  $3.7 \times 10^{10}$  disintegrations per second, and 1 Bq = disintegrations per second.

**ADR**

Automated Dosimetry Report.

**Adult**

An individual at least 18 years of age.

**As Low As Reasonably Achievable (ALARA)**

The taking of every reasonable effort to maintain exposures to radiation as far below prevailing dose limits as is practicable. These efforts must take into account —

- a. State of technology.
- b. Economics of improvements in relation to the state of the technology.
- c. Economics of improvements in relation to benefits to the public health and safety.
- d. Other societal and socioeconomic considerations in relation to use of nuclear energy and radioactive materials in the public interest.
- e. Sample of good ALARA practices may be found in the NRC Regulatory Guides 8.10, 8.18, and 10.8.

**Authorization**

A formal, Radiation Control Committee (RCC) approved document permitting named individuals to order, receive, store, possess, and use radioactive materials.

**Bioassay**

The determination of kinds, quantities, or concentrations, and in some cases, the locations or retention of radionuclides in the human body, whether by direct measurement (in vitro counting) or by indirect (in vivo) analysis of materials excreted or removed from the human body.

**Byproduct Material**

Such material includes the following:

a. Any radioactive material (except special nuclear material) yielded in, or made radioactive by, exposure to the radiation incident to the process of producing or using special nuclear material. Generally, byproduct material is any radioactive material inevitably produced as a byproduct from the neutron-induced fission process within nuclear reactors.

b. The tailings or wastes produced by the extraction or concentration of uranium or thorium from ore processing primarily for its source material content including discrete surface wastes resulting from uranium solution extraction processes. Underground ore bodies depleted by these solution extraction operations do not constitute "byproduct material" regulated by the NRC under 10 CFR.

**Committed Dose Equivalent ( $H_{T,50}$ )**

The dose equivalent that will be received from an intake of radioactive material to organs or tissues of reference (T) by an individual during the 50-year period following the intake.

**Controlled Area**

An area, outside of a restricted area but inside an installation boundary, access to which can be limited by the commander for any reason.

**Co-worker**

An individual listed on an authorization who possesses qualifications similar to the Principal User.

**Deep-Dose Equivalent**

This dose applies to external, whole-body exposure and is the dose equivalent at a tissue depth of 1 centimeter (cm) or 1000 mg/cm<sup>2</sup> below the outer skin surface.

**Dose Equivalent**

The product of the absorbed dose in tissue (D) and the quality factor (Q) at the location of interest where  $HT = D * Q$ . The units of dose equivalent are the rem and sievert (Sv). The dose equivalent in rem is equal to the absorbed dose in rads multiplied by the quality factor; 1 rem = 0.01 Sv. Its purpose is to have a single unit, regardless of the type of radiation, describing the radiation effect on man.

**Exposure**

Ionizing radiation may be either produced from machines (x-ray machines, accelerators, etc.) or

spontaneously emitted by radioactive material. An individual located near such machines or materials may be "exposed" to the ionizing radiation emitted; hence, sustain and exposure.

#### **Gieger-Mueller (G-M) Counter**

A gas-filled detector which operates with a very high electric field where a single ionization event can trigger an avalanche of ionizations. The G-M detector is very sensitive, but all pulses from the G-M tube are of the same amplitude regardless of the number of the original ion pairs or energy of the incident ionizing radiation. Therefore, the G-M detector functions only as a simple counter of ionization events.

#### **Half-life**

Time required for half the atoms in a radioactive substance to disintegrate to another nuclear form. Also called physical half-life, and each radionuclide has its own unique half-life. For the WRAMC NRC license conditions:

a. **Short Half-life.** Radioactive material containing one or more radionuclides having a radiological half-life of 65 days or less plus the following radionuclides; sulfur-35 (87.44 d), cobalt-58 (70.8 d), iridium-192 (74.02 d), and scandium-46 (83.8 d).

b. **Long Half-life.** Radioactive material containing one or more radionuclides having a radioactive half-life of more than 65 days except for the following radionuclides; sulfur-35 (87.44 d), cobalt-58 (70.8 d), iridium-192 (74.02 d), and scandium-46 (83.8 d).

#### **HPO**

Health Physics Office.

#### **Misadministration**

The administration of:

a. A radiopharmaceutical dosage greater than 30 microcuries of either sodium iodide I-125 or I-131:

(1) Involving the wrong patient or human research subject, or wrong radiopharmaceutical; or

(2) When both the administered dosage differs from the prescribed dosage by more than 20 percent of the prescribed dosage and the difference between the administered dosage and prescribed dosage exceeds 30 microcuries.

b. A therapeutic radiopharmaceutical dosage, other than sodium I-125 or I-131:

(1) Involving the wrong patient or human research subject, wrong radiopharmaceutical, or wrong route of administration; or

(2) When the administered dosage differs from the prescribed dosage by more than 20 percent of the prescribed dosage.

c. A gamma stereotactic radiosurgery radiation dose:

(1) Involving the wrong patient or human research subject, or wrong treatment site; or

(2) When the calculated total administered dose differs from the total prescribed dose by more than 10 percent of the total prescribed dose.

d. A teletherapy radiation dose:

(1) Involving the wrong patient or human research subject, wrong mode of treatment, or wrong treatment site;

(2) When the treatment consists of three or fewer fractions and the calculated total administered dose differs from the total prescribed dose by more than 10 percent of the total prescribed dose;

(3) When the calculated weekly administered dose exceeds the weekly prescribed dose by 30 percent or more of the weekly prescribed dose; or

(4) When the calculated total administered dose differs from the total prescribed dose by more than 20 percent of the total prescribed dose.

e. A brachytherapy radiation dose:

(1) Involving the wrong patient or human research subject, wrong radioisotope, or wrong treatment site (excluding, for permanent implants, seeds that were implanted in the correct site but migrated outside the treatment site);

(2) Involving a sealed source that is leaking;

(3) When, for a temporary implant, one or more sealed sources are not removed upon completion of the procedure; or

(4) When the calculated administered dose differs from the prescribed dose by more than 20 percent of the prescribed dose.

f. A diagnostic radiopharmaceutical dosage, other than quantities greater than 30 microcuries of either sodium I-125 or I-131:

(1) Involving the wrong patient or human research subject, wrong radiopharmaceutical, wrong route of administration, or when the administered dosage differs from the prescribed dosage; and

(2) When the dose to the patient or human research subject exceeds 5 rems effective dose equivalent or 50 rems dose equivalent to any individual organ.

**Nonstochastic Effects**

Also called a deterministic effect. A health effect, the severity of which varies with dose, and for which a threshold is believed to exist. Radiation induced cataract formation and skin erythema are examples of nonstochastic effects.

**Occupational Dose**

a. The dose received by an individual in a restricted area or in the course of employment in which the individual's assigned duties involve exposure to ionizing radiation from NRC- and non-NRC licensed radioactive materials as well as from machine produced ionizing radiation, whether in the possession of the owner or the radiation source (licensee) or other individual.

b. Occupational dose does not include dose received from background radiation, as a patient from medical or dental procedures, from voluntary participation in human research programs, or as a member of the general public.

**Occupationally Exposed Individual**

Any individual who receives an occupational dose of radiation as a result of employment in an occupation involving the use of radioactive material or equipment capable of producing ionizing radiation.

**Principal User**

An individual who possesses adequate training and experience with radioactive materials and bears ultimate responsibility for the ordering, receiving (from the HPO), storing, and inventory of authorized

materials. He or she is solely responsible for the implementation of the radiation protection procedures necessary to ensure the safe use of the materials specified in the authorization.

**NRC**

Nuclear Regulatory Commission.

**RAM**

Radioactive Material.

**RCC**

Radiation Control Committee.

**RPO**

Radiation Protection Officer.

a. A technically competent person designated by management to evaluate safety procedures and to supervise the application of radiation protection regulations.

b. The individual identified as the Radiation Safety Officer on a Nuclear Regulatory Commission license.

**Radiation Sources**

Material, equipment, or devices which spontaneously generate or are capable of generating ionizing radiation. They include the following:

a. Nuclear reactors.

b. Medical or dental radiographic or fluoroscopic x-ray systems.

c. Particle generators or accelerators.

d. Certain electromagnetic generators, such as klystron, magnetron, rectifier, cold-cathode, and other electron tubes operating at electrical potentials that result in the production of x-rays of such energy as to be of radiological concern.

e. X-ray diffraction, industrial radiographic, and spectrographic equipment.

f. Electron microscopes.

g. Electron-beam welding, melting, and cutting equipment.

h. Nuclear moisture or density gauges.

- i. Radioactive materials.
- j. Natural or accelerator-produced radioactive materials.
- k. Byproduct materials.
- l. Source materials.
- m. Special nuclear materials.
- n. Fission products.
- o. Materials containing induced or deposited radioactivity.
- p. Radioactive commodities.

**Radiation Protection Survey (Radioactive Materials)**

The evaluation of various locations to determine existing or potential radiation hazards associated with the use of radioactive materials.

**Radiation Protection Survey (X-ray Producing Devices)**

An evaluation, under specified conditions, of existing or potential radiation hazards associated with the use of x-ray producing devices.

**Radionuclide**

A radioactive species of atom characterized by its mass number (A), atomic number (Z), and nuclear energy state, provided that the mean life of the that state is long enough to be observable.

**Radioactive Waste**

- a. Solid, liquid, and gaseous materials that are radioactive or become radioactive and for which there is no further use.
- b. Property contaminated with radioactive materials to the extent that decontamination is economically unsound.

**Recordable Event**

The administration of:

- a. A radiopharmaceutical or radiation without a written directive where a written directive is required;
- b. A radiopharmaceutical or radiation where a written directive is required without daily recording

of each administered radiopharmaceutical dosage or radiation dose in the appropriate record;

c. A radiopharmaceutical dosage greater than 30 microcuries of either sodium iodide I-125 or I-131 when both:

(1) The administered dosage differs from the prescribed dosage by more than 10 percent of the prescribed dosage, and

(2) The difference between the administered dosage and prescribed dosage exceeds 15 microcuries;

d. A therapeutic radiopharmaceutical dosage, other than sodium iodide I-125 or I-131, when the administered dosage differs from the prescribed dosage by more than 10 percent of the prescribed dosage;

e. A teletherapy radiation dose when the calculated weekly administered dose exceeds the weekly prescribed dose by 15 percent or more of the weekly prescribed dose; or

f. A brachytherapy radiation dose when the calculated administered dose differs from the prescribed dose by more than 10 percent of the prescribed dose.

**Restricted Area**

An area, access to which is limited by the commanders of DA and DLA installations and activities for the purpose of protecting individuals from undue risks associated with exposure to ionizing radiation-producing sources, devices, and radioactive materials. Restricted areas do not include areas used as residential quarters; however, a separate room in a residential building may be set aside as a restricted area.

**SOP**

Standing Operating Procedure

**Sealed Source**

Radioactive materials sealed in an impervious container designed to prevent dispersion under normal use.

**Shallow-dose Equivalent**

The external exposure of the skin or any extremity which is taken as the dose equivalent at a tissue depth of 0.007 cm (7 mg/cm<sup>2</sup> the average depth of the germinal cell layer) averaged over an area of 1 cm<sup>2</sup>.

**Shielding Evaluation**

An evaluation of the design or modification plans for a fixed radiologic facility to preclude the occurrence of radiation hazards.

**Source Material**

a. Uranium, thorium, or any combination of uranium or thorium in any physical or chemical form; or

b. Ores which contain by weight one-twentieth of 1 percent (0.05%) or more of uranium, thorium, or any combination of uranium and thorium.

c. Source material does not include:

(1) Special nuclear material.

(2) Plutonium, <sup>233</sup>U, uranium enriched in the isotope 233 or in the isotope 235. Any other material the NRC determines to be special nuclear material as defined by 10 CFR Part 20.

(3) Special nuclear material does not include source material.

**Stochastic Effects**

Health effects that occur randomly and for which the probability of the effect occurring rather than its severity, is assumed to be a linear function of dose without threshold. Hereditary effects and cancer incidence are examples of stochastic effects.

**Total Effective Dose Equivalent (TEDE)**

The sum of the  $H_d$  (for external exposure) and the CEDE (for internal exposure) expressed in units of either rem or Sv.

**TLD**

Thermoluminescent Dosimeter.

**Technician**

An individual who works under the direct supervision of a Principal User or co-worker for the purpose of performing certain routine duties associated with the use of the radioactive materials specified in the authorization.

**Trainee**

An individual who works under the direct supervision of a Principal User or co-worker for the purpose of obtaining the necessary training and experience to

qualify for eventual status as a co-worker or Principal User.

**Weighting Factor ( $w_T$ )**

The decimal fraction specified for an organ or tissue whose magnitude is the quotient of the risk of stochastic effects resulting from the irradiation of that organ or tissue (T) to the total risk or stochastic effects when the whole body is irradiated uniformly. The  $w_T$  values used for calculating the HE are found in 10 CFR Part 20.

**Whole Body**

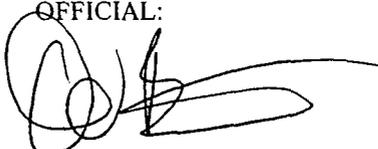
The head, trunk (including male gonads), arms above the elbow, or legs above the knee.

WRAMC Reg 40-10

The proponent of this regulation is Preventive Medicine Service, Health Physics Office. Users are invited to send suggestions and comments on DA Form 2028 (Recommend Changes to Publications and Blank Forms) to Commander, WRAMC, ATTN: MCHL-HP, Washington, DC 20307-5001.

FOR THE COMMANDER:

OFFICIAL:



DAVID A. BITTERMAN  
Major, MS  
Executive Officer

BRIAN P. FOLEY  
Colonel, MS  
Deputy Commander for  
Administration

DISTRIBUTION:

A

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

10/15/2001, and to inform you that the initial processing which includes an administrative review has been performed.

*RENEW 08-01738-03* 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** 1 3 0 4 6 5.  
When calling to inquire about this action, please refer to this control number.  
You may call us on (610) 337-5398, or 337-5260.

TRAINING AND EXPERIENCE  
AUTHORIZED USER OR RADIATION SAFETY OFFICER

1. NAME OF AUTHORIZED USER OR RADIATION SAFETY OFFICER  WILLIAM B. JOHNSON, Ph.D.		2. STATE OR TERRITORY IN WHICH LICENSED TO PRACTICE MEDICINE: NOT APPLICABLE		
3. CERTIFICATION				
SPECIALTY BOARD A	CATEGORY B	MONTH & YEAR CERTIFIED C		
NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE		
4. TRAINING RECEIVED IN BASIC RADIOACTIVE HANDLING TECHNIQUES				
FIELD OF TRAINING A	LOCATION AND DATE(S) OF TRAINING B	TYPE & LENGTH OF TRAINING		
		LECTURE/ LABORATORY COURSES (Hours) C	SUPERVISED LABORATORY EXPERIENCE (Hours) D	
a. RADIATION PHYSICS AND INSTRUMENTATION	1) Univ of North Carolina, Chapel Hill, NC, 1980-1983 (3 years) 2) Tulane, New Orleans, LA, 1976 (1 year) 3) Ft. Belvoir, VA, 1970-1971 (1 year)	80  60  168	92	
b. RADIATION PROTECTION	1) Reference 1 above 2) Reference 3 above	140 80	60 120	
c. MATHEMATICS IN THE USE AND MEASUREMENT OF RADIOACTIVITY	1) Reference 1 above 2) Reference 3 above	125 60		
d. RADIATION BIOLOGY	1) Reference 1 above 2) Reference 3 above	40 40		
e. RADIOPHARMACEUTICAL CHEMISTRY	1) Reference 1 above 2) Reference 3 above	200	60 20	
5. EXPERIENCE WITH RADIATION. (Actual use of Radioisotopes or Equivalent Experience)				
ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE GAINED	DURATION OF EXPERIENCE	TYPE OF USE
SM-1 Nuclear Power Reactor	1000 KW	SM-1, Ft. Belvoir, VA	1971 (1 year)	Health Physics Surveys; Reactor operations; Calibration

5. EXPERIENCE WITH RADIATION.(Actual use of Radioisotopes or Equivalent Experience)				
ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE GAINED	DURATION OF EXPERIENCE	TYPE OF USE
<sup>235</sup> U <sup>238</sup> U <sup>239</sup> Pu Pu-Be <sup>241</sup> Am <sup>137</sup> Cs <sup>3</sup> H	216 gm unsealed & soln. sources 3 gm unsealed source 43 gm, liquid sources 3 Ci, Sealed 600 mCi, Sealed 120 Ci, Sealed 110 Ci, Sealed	U.S. Army Environmental Hygiene Agency Aberdeen Proving Ground, MD  NRC Byproduct Material License	1973-1974 (1 year)	Health Physics Surveys; Alternate RSO; Calibration
Atomic No. 3-83 <sup>3</sup> H <sup>131</sup> I <sup>125</sup> I <sup>13</sup> C	5 mCi each 10 mCi, liquid 10 mCi, liquid 1 Ci, liquid 1 Ci, liquid	US Army Medical Lab Ft. Sam Houston, TX Radiation Safety Officer NRC Byproduct Material License (Medical)	1974-1975 (1 year)	RSO, RIA kits, Iodinations, Health Physics Surveys; Wet Chemistry procedures
<sup>99</sup> Mo/ <sup>99m</sup> Tc Generator	2 Ci	North Carolina Memorial Hospital Chapel Hill, NC	1982 (1 month)	Clinical Training
Atomic No. 3-83 10 CFR 35 Gp I-II Gp III Gp IV-V <sup>133</sup> Xe <sup>137</sup> Cs <sup>153</sup> Gd	25 mCi each  As needed 3 Ci each As needed 40 mCi 131 Ci 2 Ci	Dwight D. Eisenhower Army Medical Center, Fort Gordon, GA  Radiation Safety Officer for Hybrid Broad Scope NRC Materials License (Medical) USNRC No. 10-12044-03	May 1983-June 1989 (6 years)	RSO, Radiation Safety Surveys, Medical Physics Surveys, Calibration
Atomic No. 3-83  <sup>14</sup> C, <sup>3</sup> H, <sup>99</sup> Mo, <sup>99m</sup> Tc  <sup>32</sup> P, <sup>125</sup> I  <sup>137</sup> Cs	15 Ci total, ≤ 200 mCi each  5 Ci each, any form  1 Ci each, any form 4200 Ci, sealed source	Uniformed Services University of the Health Sciences, Bethesda, MD  Radiation Safety Officer for Broad Scope Type A NRC Material License (Medical) USNRC No. 19-23344-01	May 1989-June 1992 (3 years)	RSO, Health Physics Surveys, Calibration



UNITED STATES  
NUCLEAR REGULATORY COMMISSIO.  
REGION I  
475 ALLENDALE ROAD  
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

November 7, 2001

Docket No. 03006895  
Control No. 130465

License No. 08-01738-03

Colonel William B. Johnson, MS  
Radiation Protection Officer  
Department of the Army  
Walter Reed Army Medical Center  
Bldg. 41, Room 38  
Washington, DC 20307

SUBJECT: DEPARTMENT OF THE ARMY, ISSUANCE OF LICENSE RENEWAL,  
CONTROL NO. 130465

Dear Colonel Johnson:

This refers to your request for renewal of your NRC license. Enclosed with this letter is the renewed 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 U.S. Nuclear Regulatory Commission, Region I Office, Licensing Assistance Team, (610) 337-5239, so that we can provide appropriate corrections and answers.

In the future, please refrain from providing personal information (e.g., curriculum vitae with home residence and telephone number listed). We took the liberty to delete these items in our computer database.

The NRC is required to have your Taxpayer Identification Number in order to make payments (refunds). The self-addressed, stamped NRC Form 531, "Request for Taxpayer Identification Number," is enclosed.

The NRC expects licensees to conduct their programs with meticulous attention to detail and high standards of compliance. Because of the serious consequences to employees and the public that can result from failure to comply with NRC requirements, you must conduct your program according to NRC regulations, the conditions of your NRC license, and the representations made in your application. In particular, note that you must:

1. Operate in accordance with NRC regulations 10 CFR Part 19, "Notices, Instructions and Reports to Workers; Inspections," 10 CFR Part 20, "Standards for Protection Against Radiation," and other applicable regulations.
2. Notify the NRC in writing of any change in mailing address.

II/B

Information in this record was deleted  
in accordance with the Freedom of Information  
Act, exemptions 2  
FOIA 2008-0238

NMSS/RGNI MATERIALS-001

3. In accordance with 10 CFR 30.36(d), notify the NRC, promptly, in writing, and request termination of the license
  - a) when you decide to terminate all activities involving materials authorized under the license; or
  - b) if you decide not to acquire or possess and use authorized material.
4. Request and obtain a license Amendment before you:
  - a) change Radiation Safety Officers;
  - b) order byproduct material in excess of the amount, or radionuclide, or form different than authorized on the license; or
  - c) add or change the areas of use, or addresses of use identified in the license application or on the license; or
  - d) change the name or ownership of your organization.
5. Submit a complete renewal application or termination request at least 30 days before the expiration date of your license. You will receive a reminder notice approximately 90 days before the expiration date. Possession of byproduct material after your license expires is a violation of NRC regulations.

In addition, please note that NRC Form 313 requires the applicant, by signature, to verify that the applicant understands that all statements contained in the application are true and correct to the best of the applicant's knowledge. The signatory for the application should be the licensee or a certifying official of the licensee rather than a consultant.

You will be periodically inspected by the NRC. Failure to conduct your program in accordance with NRC regulations, license conditions, and representations made in your license application and supplemental correspondence with NRC will result in enforcement action against you. This could include issuance of a notice of violation, or imposition of a civil penalty, or an order suspending, modifying or revoking your license as specified in NUREG 1600, "General Policy and Procedure for NRC Enforcement Actions" (Enforcement Policy).

In accordance with 10 CFR 2.790, a copy of this letter will be placed in the NRC Public Document Room and will be accessible from the NRC Web site at <http://www.nrc.gov/NRC/ADAMS/index.html>.

W. Johnson  
Department of the Army

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Thank you for your cooperation.

Sincerely,

***Original signed by Kathy Dolce Modes***

Kathy Dolce Modes  
Health Physicist  
Nuclear Materials Safety Branch 2  
Division of Nuclear Materials Safety

Enclosures:

1. Amendment No. 27
2. 10 CFR Parts 19, 20, 21, 30, 71, 170, and 171
3. NRC Forms 3, 313, and 531
4. Section 206 of the Energy Reorganization Act of 1974
5. NUREG 1600, General Policy and Procedure for NRC Enforcement Actions  
(Enforcement Policy)

W. Johnson  
Department of the Army

4

DOCUMENT NAME: G:\Docs\Current\Lic Cvr Letter\L08-01738-03.130465.wpd

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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

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NAME	KModesKAD						
DATE	11/7/2001	KAD					

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MATERIALS LICENSE

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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.

<p>Licensee</p> <p>1. Department of the Army Walter Reed Army Medical Center</p> <p>2. Bldg 41, Room 38 Washington, D.C. 20307-5001</p>	<p>In accordance with the application dated October 15, 2001,</p> <p>3. License number 08-01738-03 is amended in its entirety to read as follows:</p> <p>4. Expiration date November 30, 2011</p> <p>5. Docket No. 030-06895 Reference No.</p>
---	--

<p>6. Byproduct, source, and/or special nuclear material</p> <p>A. Cobalt 60</p>	<p>7. Chemical and/or physical form</p> <p>A. Sealed Sources</p>	<p>8. Maximum amount that licensee may possess at any one time under this license</p> <p>A. No single source to exceed the maximum activity per source or maximum activity per device specified in the certificate of registration issued by the U.S. Nuclear Regulatory Commission or an Agreement State</p>
<p>B. Cesium 137</p>	<p>B. Sealed Sources</p>	<p>B. No single source to exceed the maximum activity per source or maximum activity per device specified in the certificate of registration issued by the U.S. Nuclear Regulatory Commission or an Agreement State</p>

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License Number

08-01738-03

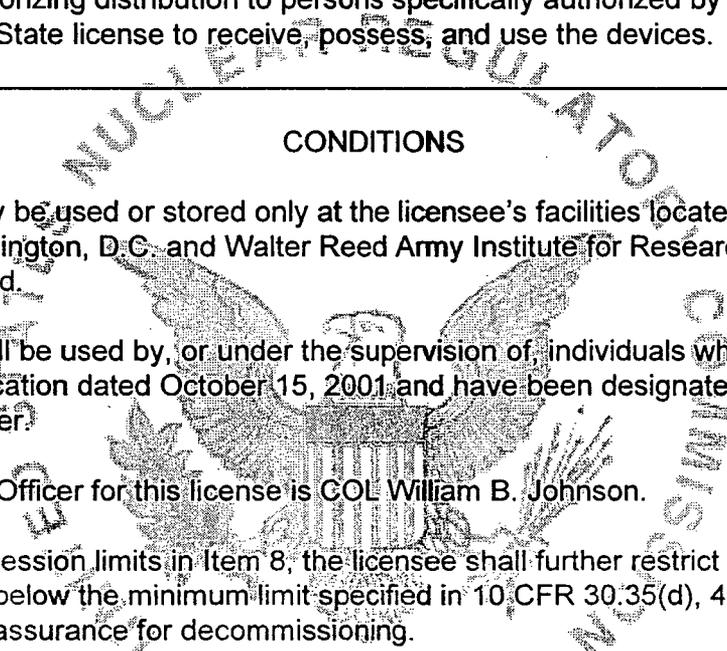
Docket or Reference Number

030-06895

Amendment No. 27

## 9. Authorized use:

- A. and B. For irradiation of materials in self-shielded irradiator devices that have been registered either with the U.S. Nuclear Regulatory Commission under 10 CFR 32.210 or with an Agreement State and which have been distributed in accordance with a Commission or Agreement State specific license authorizing distribution to persons specifically authorized by a Commission or Agreement State license to receive, possess, and use the devices.



CONDITIONS

10. Licensed material may be used or stored only at the licensee's facilities located at Walter Reed Army Medical Center, Washington, D.C. and Walter Reed Army Institute for Research, Forest Glen Annex, Silver Spring, Maryland.
11. Licensed material shall be used by, or under the supervision of, individuals who have received the training described in the application dated October 15, 2001 and have been designated, in writing, by the Radiation Safety Officer.
12. The Radiation Safety Officer for this license is COL William B. Johnson.
13. In addition to the possession limits in Item 8, the licensee shall further restrict the possession of licensed material to quantities below the minimum limit specified in 10 CFR 30.35(d), 40.36(b), and 70.25(d) for establishing financial assurance for decommissioning.
14. The licensee is exempted from decommissioning financial assurance requirements for possession of licensed material in sealed sources in quantities greater than the limits in 10 CFR 30.35(d) for the purpose of source changes only. This exemption is granted for no more than 30 days for any one source change.
15. A. Sealed sources shall be tested for leakage and/or contamination at intervals not to exceed the intervals specified in the certificate of registration issued by the U.S. Nuclear Regulatory Commission under 10 CFR 32.210 or under equivalent regulations of an Agreement State.
- B. In the absence of a certificate from a transferor indicating that a leak test has been made within the intervals specified in the certificate of registration issued by the U.S. Nuclear Regulatory Commission under 10 CFR 32.210 or under equivalent regulations of an Agreement State, prior to the transfer, a sealed source received from another person shall not be put into use until tested and the test results received.

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License Number

08-01738-03

Docket or Reference Number

030-06895

Amendment No. 27

- C. Sealed sources need not be tested if they are in storage and are not being used; however, when they are removed from storage for use or transferred 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 shall be stored for a period of more than 10 years without being tested for leakage and/or contamination.
- D. The leak test shall be capable of detecting the presence of 0.005 microcurie (185 becquerels) of radioactive material on the test sample. If the test reveals the presence of 0.005 microcurie (185 becquerels) or more of removable contamination, a report shall be filed with the U.S. Nuclear Regulatory Commission in accordance with 10 CFR 30.50(c)(2), and the source shall be removed immediately from service and decontaminated, repaired, or disposed of in accordance with Commission regulations.
- E. Tests for leakage and/or contamination, including leak test sample collection and analysis, shall be performed by the licensee or by other persons specifically licensed by the U.S. Nuclear Regulatory Commission or an Agreement State to perform such services.
16. Sealed sources containing licensed material shall not be opened or sources removed from source holders by the licensee.
17. The licensee shall not repair, remove, replace, or alter any of the following: electrical and mechanical systems that control source or shielding movement, the irradiator's shielding or sealed source, safety interlocks, or any component that may affect safe operation of the irradiator. These activities shall be performed by a person specifically licensed by the U.S. Nuclear Regulatory Commission or an Agreement State to perform such services.
18. For each  cesium-137 irradiator installed and used, the licensee shall:
- Permit the use of the irradiator only when a calibrated and operable radiation survey meter or room monitor is available; and
  - Permit the irradiator door to be opened only after the operator has checked visual indicators to verify that the source has returned to its safe storage position; and
  - Have room monitors installed that will:
    - Operate at all times when the irradiator is in use; and
    - Activate a visible and audible alarm when radiation exceeds 2 millirems per hour; and
    - Detect any radiation leaking from the irradiator door; and
    - Be visible to the irradiator user when the user is next to the irradiator; or

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License Number 08-01738-03
Docket or Reference Number 030-06895
Amendment No. 27

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D. If a room monitor is not installed, have available a calibrated and operable survey meter which will be used to:

- (i) Determine the radiation level at the irradiator door when the door is closed; and
- (ii) Check for any increase in radiation levels each time the irradiator door is opened.

E. If abnormal radiation levels or any malfunctions of the irradiator are detected at any time, the licensee shall cease using the irradiator, restrict access to the area housing the irradiator, immediately notify the Radiation Safety Officer, and submit all reports required under 10 CFR Parts 20, 21 or 30.

F. Not repair or authorize repairs of the irradiator except by the manufacturer or other persons specifically authorized by the U.S. Nuclear Regulatory Commission or an Agreement State to perform such services.

19. The licensee is authorized to transport licensed material in accordance with the provisions of 10 CFR Part 71, "Packaging and Transportation of Radioactive Material."

20. 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 U.S. 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 15, 2001

For the U.S. Nuclear Regulatory Commission

Original signed by Kathy Dolce Modes

Date November 7, 2001

By

Kathy Dolce Modes  
Nuclear Materials Safety Branch 2  
Division of Nuclear Materials Safety

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Regional  
King of Prussia, Pennsylvania 19406

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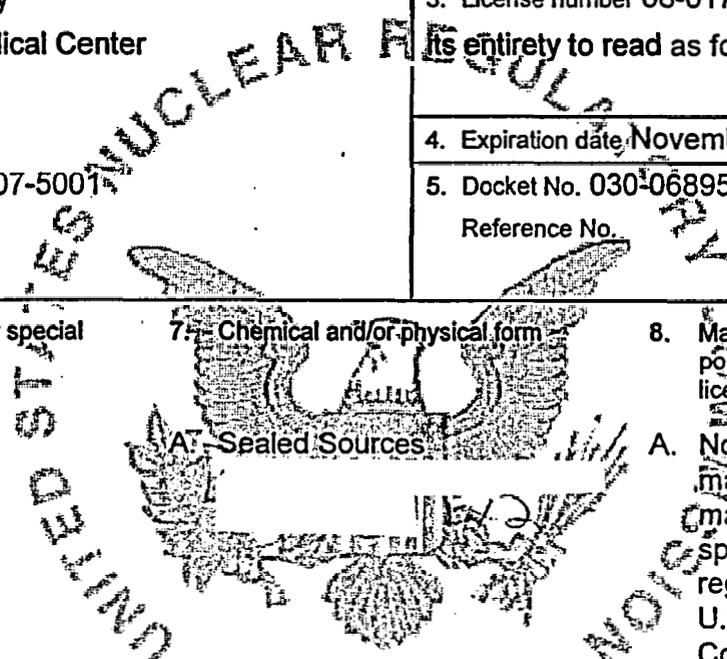
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MATERIALS LICENSE

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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.

<p>Licensee</p> <p>1. Department of the Army Walter Reed Army Medical Center</p> <p>2. Bldg 41, Room 38 Washington, D.C. 20307-5001</p>	<p>In accordance with the letter dated July 19, 2002,</p> <p>3. License number 08-01738-03 is amended in its entirety to read as follows:</p> <p>4. Expiration date November 30, 2011</p> <p>5. Docket No. 030-06895 Reference No.</p>
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<p>6. Byproduct, source, and/or special nuclear material</p> <p>A. Cobalt 60</p> <p>B. Cesium 137</p>	<p>7. Chemical and/or physical form</p> <p>A. Sealed Sources</p> <p>B. Sealed Sources</p> <div style="border: 1px solid black; height: 150px; width: 100%;"></div>	<p>8. Maximum amount that licensee may possess at any one time under this license</p> <p>A. No single source to exceed the maximum activity per source or maximum activity per device specified in the certificate of registration issued by the U.S. Nuclear Regulatory Commission or an Agreement State</p> <p>B. No single source to exceed the maximum activity per source or maximum activity per device specified in the certificate of registration issued by the U.S. Nuclear Regulatory Commission or an Agreement State</p> <p style="text-align: right;">Ex 2</p>
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License Number

08-01738-03

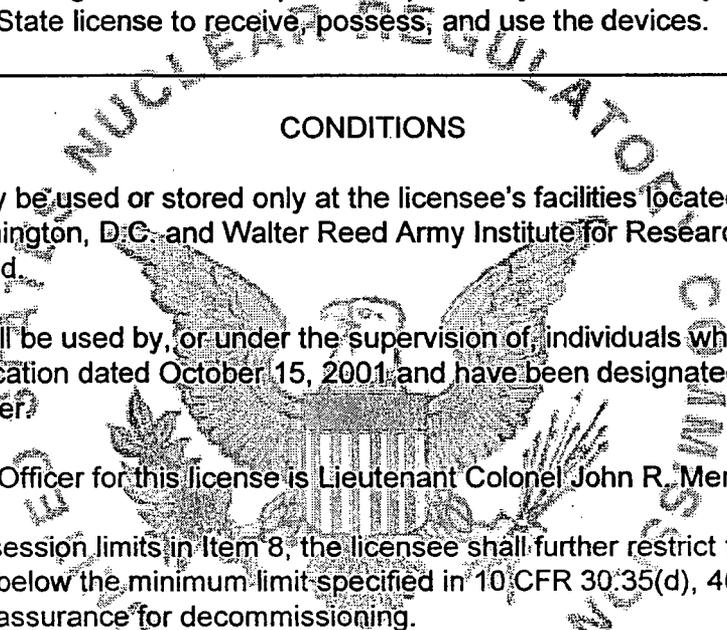
Docket or Reference Number

030-06895

Amendment No. 28

## 9. Authorized use:

- A. and B. For irradiation of materials in self-shielded irradiator devices that have been registered either with the U.S. Nuclear Regulatory Commission under 10 CFR 32.210 or with an Agreement State and which have been distributed in accordance with a Commission or Agreement State specific license authorizing distribution to persons specifically authorized by a Commission or Agreement State license to receive, possess, and use the devices.



CONDITIONS

10. Licensed material may be used or stored only at the licensee's facilities located at Walter Reed Army Medical Center, Washington, D.C. and Walter Reed Army Institute for Research, Forest Glen Annex, Silver Spring, Maryland.
11. Licensed material shall be used by, or under the supervision of, individuals who have received the training described in the application dated October 15, 2001 and have been designated, in writing, by the Radiation Safety Officer.
12. The Radiation Safety Officer for this license is Lieutenant Colonel John R. Mercier.
13. In addition to the possession limits in Item 8, the licensee shall further restrict the possession of licensed material to quantities below the minimum limit specified in 10 CFR 30.35(d), 40.36(b), and 70.25(d) for establishing financial assurance for decommissioning.
14. The licensee is exempted from decommissioning financial assurance requirements for possession of licensed material in sealed sources in quantities greater than the limits in 10 CFR 30.35(d) for the purpose of source changes only. This exemption is granted for no more than 30 days for any one source change.
15. A. Sealed sources shall be tested for leakage and/or contamination at intervals not to exceed the intervals specified in the certificate of registration issued by the U.S. Nuclear Regulatory Commission under 10 CFR 32.210 or under equivalent regulations of an Agreement State.
- B. In the absence of a certificate from a transferor indicating that a leak test has been made within the intervals specified in the certificate of registration issued by the U.S. Nuclear Regulatory Commission under 10 CFR 32.210 or under equivalent regulations of an Agreement State, prior to the transfer, a sealed source received from another person shall not be put into use until tested and the test results received.

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License Number 98-01738-03
Docket or Reference Number 030-06895
Amendment No. 28

- C. Sealed sources need not be tested if they are in storage and are not being used; however, when they are removed from storage for use or transferred 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 shall be stored for a period of more than 10 years without being tested for leakage and/or contamination.
- D. The leak test shall be capable of detecting the presence of 0.005 microcurie (185 becquerels) of radioactive material on the test sample. If the test reveals the presence of 0.005 microcurie (185 becquerels) or more of removable contamination, a report shall be filed with the U.S. Nuclear Regulatory Commission in accordance with 10 CFR 30.50(c)(2), and the source shall be removed immediately from service and decontaminated, repaired, or disposed of in accordance with Commission regulations.
- E. Tests for leakage and/or contamination, including leak test sample collection and analysis, shall be performed by the licensee or by other persons specifically licensed by the U.S. Nuclear Regulatory Commission or an Agreement State to perform such services.

16. Sealed sources containing licensed material shall not be opened or sources removed from source holders by the licensee.

17. The licensee shall not repair, remove, replace, or alter any of the following: electrical and mechanical systems that control source or shielding movement, the irradiator's shielding or sealed source, safety interlocks, or any component that may affect safe operation of the irradiator. These activities shall be performed by a person specifically licensed by the U.S. Nuclear Regulatory Commission or an Agreement State to perform such services.

18. For each  cesium-137 irradiator installed and used, the licensee shall:

- A. Permit the use of the irradiator only when a calibrated and operable radiation survey meter or room monitor is available; and
- B. Permit the irradiator door to be opened only after the operator has checked visual indicators to verify that the source has returned to its safe storage position; and
- C. Have room monitors installed that will:
  - (i) Operate at all times when the irradiator is in use; and
  - (ii) Activate a visible and audible alarm when radiation exceeds 2 millirems per hour; and
  - (iii) Detect any radiation leaking from the irradiator door; and
  - (iv) Be visible to the irradiator user when the user is next to the irradiator; or

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License Number

08-01738-03

Docket or Reference Number

030-06895

Amendment No. 28

D. If a room monitor is not installed, have available a calibrated and operable survey meter which will be used to:

- (i) Determine the radiation level at the irradiator door when the door is closed; and
- (ii) Check for any increase in radiation levels each time the irradiator door is opened.

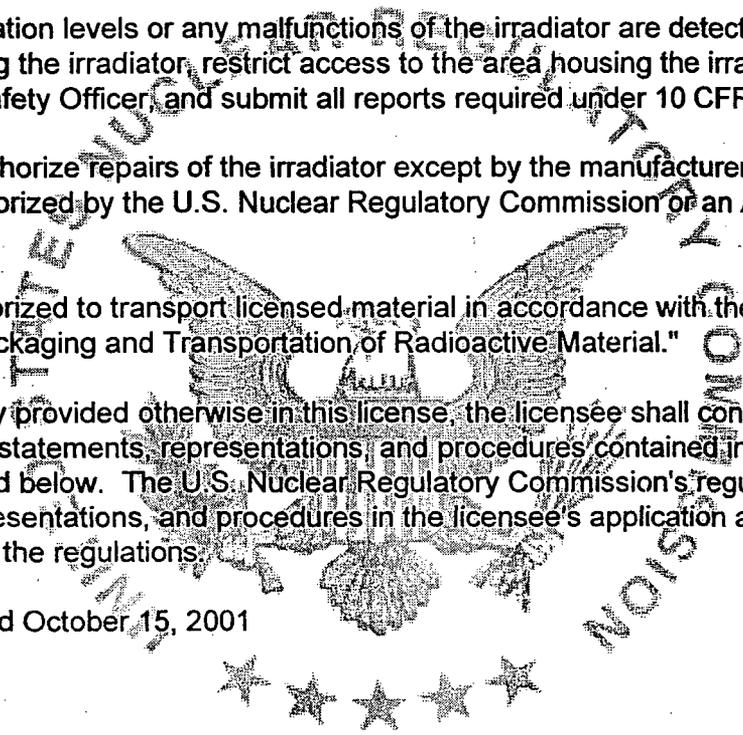
E. If abnormal radiation levels or any malfunctions of the irradiator are detected at any time, the licensee shall cease using the irradiator, restrict access to the area housing the irradiator, immediately notify the Radiation Safety Officer, and submit all reports required under 10 CFR Parts 20, 21 or 30.

F. Not repair or authorize repairs of the irradiator except by the manufacturer or other persons specifically authorized by the U.S. Nuclear Regulatory Commission or an Agreement State to perform such services.

19. The licensee is authorized to transport licensed material in accordance with the provisions of 10 CFR Part 71, "Packaging and Transportation of Radioactive Material."

20. 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 U.S. 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 15, 2001



For the U.S. Nuclear Regulatory Commission

Original signed by Sattar Lodhi, Ph.D.

Date August 8, 2002

By

Sattar Lodhi, Ph.D.  
 Nuclear Materials Safety Branch 2  
 Division of Nuclear Materials Safety  
 Region I  
 King of Prussia, Pennsylvania 19406

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FORM NRC-313 I (1-79) 10 CFR 30 U.S. NUCLEAR REGULATORY COMMISSION APPLICATION FOR: (Check and/or complete as appropriate)

**APPLICATION FOR BYPRODUCT MATERIAL LICENSE INDUSTRIAL**

See attached instructions for details.

Completed applications are filed in duplicate with the Division of Fuel Cycle and Material Safety, Office of Nuclear Material Safety, and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555 or applications may be filed in person at the Commission's office at 1717 H Street, NW, Washington, D. C. or 7915 Eastern Avenue, Silver Spring, Maryland.

a. NEW LICENSE  
b. AMENDMENT TO: LICENSE NUMBER  
c. RENEWAL OF: LICENSE NUMBER

X 08-01738-03

2. APPLICANT'S NAME (Institution, firm, person, etc.)  
Walter Reed Army Medical Center  
Washington, DC 20307-5001  
TELEPHONE NUMBER: AREA CODE - NUMBER EXTENSION  
202-576-1100

3. NAME OF PERSON TO BE CONTACTED REGARDING THIS APPLICATION  
LTC William F. Woodward  
Health Physics Officer, WRAMC  
TELEPHONE NUMBER: AREA CODE - NUMBER EXTENSION  
301-427-5104

4. APPLICANT'S MAILING ADDRESS (Include Zip Code)  
Commander  
Walter Reed Army Medical Center  
ATTN: HSWP-QHP  
Washington, D.C. 20307-5001

5. STREET ADDRESS WHERE LICENSED MATERIAL WILL BE USED (Include Zip Code)  
Walter Reed Army Institute of Research, Washington, DC 20307-5001 & US Army Medical Research Institute for Infectious Diseases, Ft Detrick, Frederick, MD 21701

(IF MORE SPACE IS NEEDED FOR ANY ITEM, USE ADDITIONAL PROPERLY KEYED PAGES.)

6. INDIVIDUAL(S) WHO WILL USE OR DIRECTLY SUPERVISE THE USE OF LICENSED MATERIAL (See Items 16 and 17 for required training and experience of each individual named below)

FULL NAME	TITLE
Individuals approved by the Radiation Control Committee, a. Walter Reed Army Medical Center	
b.	
c.	

7. RADIATION PROTECTION OFFICER  
LTC William E. Woodward - Ref: AR 40-14 & AR 40-37, the Health Physics Officer will be appointed by the Commanding General, WRAMC.

Attach a resume of person's training and experience as outlined in Items 16 and 17 and describe his responsibilities under Item 15.

8. LICENSED MATERIAL

L I N E NO.	ELEMENT AND MASS NUMBER A	CHEMICAL AND/OR PHYSICAL FORM B	NAME OF MANUFACTURER AND MODEL NUMBER (If Sealed Source) C	MAXIMUM NUMBER OF MILLICURIES AND/OR SEALED SOURCES AND MAXIMUM ACTIVITY PER SOURCE WHICH WILL BE POSSESSED AT ANY ONE TIME D
(1)	Cobalt-60	Sealed Source	AECL, Model C-166, C-167 or C-198	Max. total Ci: 16,000 Max. Ci/source: 16,000
(2)	Cesium-137	Sealed Source	AECL, Model C-161-Type 8	Max. Total Ci: 4,000 Max. Ci/source: 2,100
(3)	Cobalt-60	Sealed Source	AECL, Model C-198	Max. total Ci: 26,400 Max. Ci/source: 26,400
(4)	Cesium-137	Sealed Source	AECL, Model C-161-Type 8	Max. total Ci: 4,2000 Max. Ci/source: 2,100

DESCRIBE USE OF LICENSED MATERIAL

E

(1)	To be used in AECL Gammacell 220 irradiator located at WRAIR, Washington, DC for medical research and development and radiation dosimetry.
(2)	To be used in AECL Gammacell 40 Irradiator located at WRAIR, Washington, DC for small animal irradiation, medical research, development and radiation dosimetry
(3)	To be used in AECL Gammacell 220 Irradiator located at USAMRIID, Ft. Detrick, Frederick, MD for medical research and development & radiation dosimetry.
(4)	To be used in AECL Gammacell 40 Irradiator located at USAMRIID, Ft. Detrick, Frederick, MD for medical research and development and radiation dosimetry.

Information in this record was prepared in accordance with the Freedom of Information Act, exemptions

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**9. STORAGE OF SEALED SOURCES**

LINE NO.	CONTAINER AND/OR DEVICE IN WHICH EACH SEALED SOURCE WILL BE STORED OR USED. A.	NAME OF MANUFACTURER B.	MODEL NUMBER C.
(1)	AECL Gammacell 220 Irradiator	Atomic Energy of Canada Limited	Gammacell 220
(2)	AECL Gammacell 40 Irradiator	Atomic Energy of Canada Limited	Gammacell 40
(3)	AECL Gammacell 220 Irradiator	Atomic Energy of Canada Limited	Gammacell 220
(4)	AECL Gammacell 40 Irradiator	Atomic Energy of Canada Limited	Gammacell 40

**10. RADIATION DETECTION INSTRUMENTS**

LINE NO.	TYPE OF INSTRUMENT A	MANUFACTURER'S NAME B	MODEL NUMBER C	NUMBER AVAILABLE D	RADIATION DETECTED (alpha, beta, gamma, neutron) E	SENSITIVITY RANGE (milliroentgens/hour or counts/minute) F
(1)	REFERENCE:	Application for renewal of NRC Materials License - Medical, No. 08-01738-02, 18 July 1979, Tab 9				
(2)						
(3)						
(4)						

**11. CALIBRATION OF INSTRUMENTS LISTED IN ITEM 10**

<input checked="" type="checkbox"/> a. CALIBRATED BY SERVICE COMPANY NAME, ADDRESS, AND FREQUENCY REFERENCE: Application for renewal of NRC Material License - Medical, No. 08-01738-02, 18 July 1979, Tab 10.	<input type="checkbox"/> b. CALIBRATED BY APPLICANT Attach a separate sheet describing method, frequency and standards used for calibrating instruments.
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**12. PERSONNEL MONITORING DEVICES**

TYPE (Check and/or complete as appropriate.) A	SUPPLIER (Service Company) B	EXCHANGE FREQUENCY C
<input type="checkbox"/> (1) FILM BADGE <input type="checkbox"/> (2) THERMOLUMINESCENCE DOSIMETER (TLD) <input type="checkbox"/> (3) OTHER (Specify): _____ _____ _____	REFERENCE: Application for renewal of NRC Materials License - Medical, No. 08-1738-02, 18 July 1979; page 3 of Form NRC-313M.	<input type="checkbox"/> MONTHLY <input type="checkbox"/> QUARTERLY <input type="checkbox"/> OTHER (Specify): _____ _____

**13. FACILITIES AND EQUIPMENT** (Check where appropriate and attach annotated sketch(es) and description(s).)

<input type="checkbox"/> a. LABORATORY FACILITIES, PLANT FACILITIES, FUME HOODS (Include filtration, if any), ETC. <input checked="" type="checkbox"/> b. STORAGE FACILITIES, CONTAINERS, SPECIAL SHIELDING (fixed and/or temporary), ETC. <input type="checkbox"/> c. REMOTE HANDLING TOOLS OR EQUIPMENT, ETC. <input type="checkbox"/> d. RESPIRATORY PROTECTIVE EQUIPMENT, ETC.	SEE SUPPLEMENT NO. 1.
---	-----------------------

**14. WASTE DISPOSAL**

a. NAME OF COMMERCIAL WASTE DISPOSAL SERVICE EMPLOYED

b. IF COMMERCIAL WASTE DISPOSAL SERVICE IS NOT EMPLOYED, SUBMIT A DETAILED DESCRIPTION OF METHODS WHICH WILL BE USED FOR DISPOSING OF RADIOACTIVE WASTES AND ESTIMATES OF THE TYPE AND AMOUNT OF ACTIVITY INVOLVED. IF THE APPLICATION IS FOR SEALED SOURCES AND DEVICES AND THEY WILL BE RETURNED TO THE MANUFACTURER, SO STATE.

Sealed sources specified in this application will be returned to the manufacturer for disposal.

**INFORMATION REQUIRED FOR ITEMS 15, 16 AND 17**

Describe in detail the information required for Items 15, 16 and 17. Begin each item on a separate page and key to the application as follows:

- 15. **RADIATION PROTECTION PROGRAM.** Describe the radiation protection program as appropriate for the material to be used including the duties and responsibilities of the Radiation Protection Officer, control measures, bioassay procedures (if needed), day-to-day general safety instruction to be followed, etc. If the application is for sealed source's also submit leak testing procedures, or if leak testing will be performed using a leak test kit, specify manufacturer and model number of the leak test kit.
  
- 16. **FORMAL TRAINING IN RADIATION SAFETY.** Attach a resume for each individual named in Items 6 and 7. Describe individual's formal training in the following areas where applicable. Include the name of person or institution providing the training, duration of training, when training was received, etc.
  - a. Principles and practices of radiation protection.
  - b. Radioactivity measurement standardization and monitoring techniques and instruments.
  - c. Mathematics and calculations basic to the use and measurement of radioactivity.
  - d. Biological effects of radiation.
  
- 17. **EXPERIENCE.** Attach a resume for each individual named in Items 6 and 7. Describe individual's work experience with radiation, including where experience was obtained. Work experience or on-the-job training should be commensurate with the proposed use. Include list of radioisotopes and maximum activity of each used.

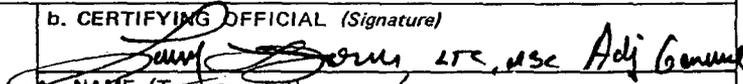
SEE SUPPLEMENT NO. 2

**18. CERTIFICATE**

*(This item must be completed by applicant)*

*The applicant and any official executing this certificate on behalf of the applicant named in Item 2, certify that this application is prepared in conformity with Title 10, Code of Federal Regulations, Part 30, and that all information contained herein, including any supplements attached hereto, is true and correct to the best of our knowledge and belief.*

**WARNING.**—18 U.S.C., Section 1001; Act of June 25, 1948; 62 Stat. 749; makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

a. LICENSE FEE REQUIRED (See Section 170.31, 10 CFR 170)	b. CERTIFYING OFFICIAL (Signature) 
(1) LICENSE FEE CATEGORY:	c. NAME (Type or print) LEWIS A. MOLOGNE, MD
(2) LICENSE FEE ENCLOSED: \$	d. TITLE Major General, MC Commanding
	e. DATE 17 MAY 1985

S U P P L E M E N T    N O.   1

Item 13, Form NRC-313(I), Facilities and Equipment Renewal Application for NRC  
NRC License 08-01738-03

1. Item 13a, Facilities:

a. AECL Gammacells listed on lines number 1 and 2, Item 8 of this application are located on the ground level of Building 40, Room B099, Walter Reed Army Institute of Research (WRAIR), Walter Reed Army Medical Center, Washington, DC. The Gammacell 220 is located in the northeast corner of Room B099. The Gammacell 40 is located in the irradiation suite of Room B099. Since the irradiation suite was designed for X-ray use, it is constructed with lead-lined walls, door, and a thick concrete ceiling. The only entrance to Room B099 is a door located in the southwest corner. A diagram of Room B099 is attached as Inclosure 1 to this supplement.

b. AECL Gammacells listed on lines number 3 and 4, Item 8 of this application are located on the ground level of Building 1425, Room AA413, USAMRIID, Fort Detrick, MD. Since Room AA413 was designed as an irradiation suite, the walls and ceiling are constructed of high density concrete of 12" and 16" thickness respectively. The room is bordered on two sides by biological hot suites and on two sides by infrequently used hallways. The overhead area is a pipe and ventilation crawl space which would be occupied only in case of repairs. A diagram of Room AA413 is attached as Inclosure 2 to this supplement.

2. Item 13b, Storage Facilities, Containers and Special Shielding:

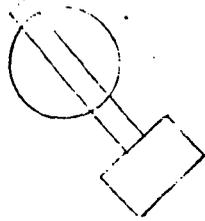
AECL Gammacells listed in Item 8 of this application will be permanently used and stored in the locations specified above. Since the sealed sources will not be removed from their respective Gammacell units, no additional containment or shielding is required.

3. Item 13c and d, Remote Handling Tools and Respiratory Protective Equipment:

Since the sealed sources are an integral part of the Gammacell unit, no remote handling tools, equipment or respiratory protective equipment is required for operations involving use of the Gammacell units. Equipment that could be utilized to respond to an unforeseen emergency is specified in the application for renewal of NRC Material License - Medical, No. 08-01738-02, 18 July 1979, Tab 11.

Hallway

X-ray Unit



N

Fill

GAMMACELL

40

Pb Glass

X-ray control

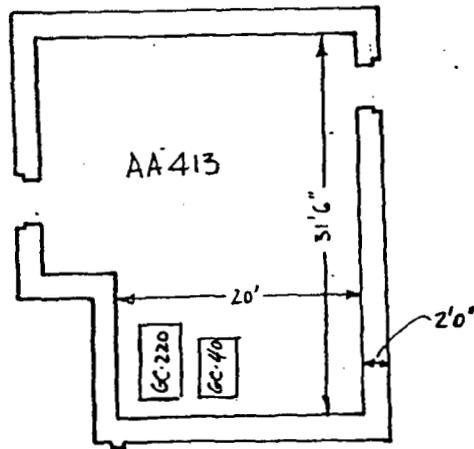
-GAMMA-CELL

220

ROOM B099

LAB

No Scale



VIROLOGY DIVISION

STAFF AREA

BACTERIOLOGY DIVISION

SUITE 11

SUITE 4

SUITE 3

SUITE 2

SUITE 1

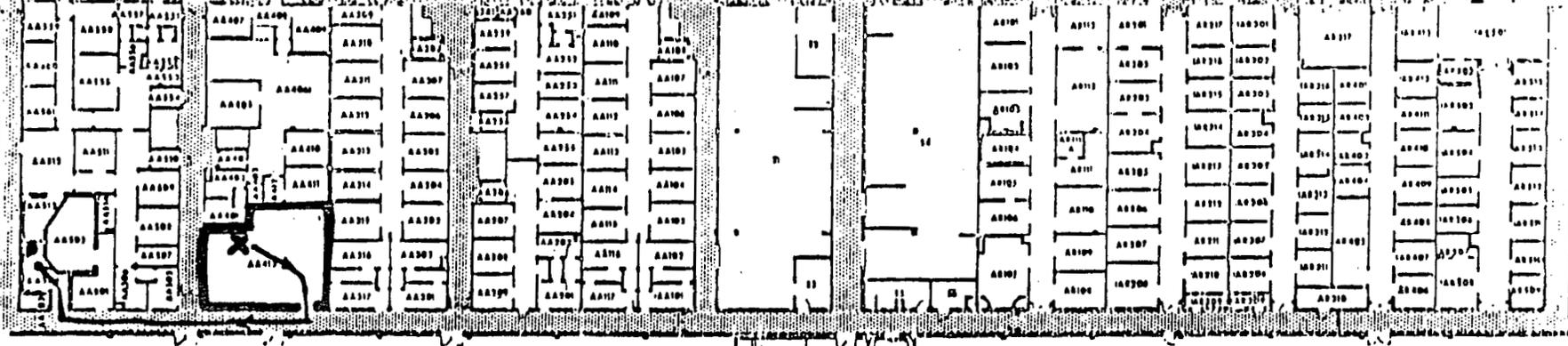
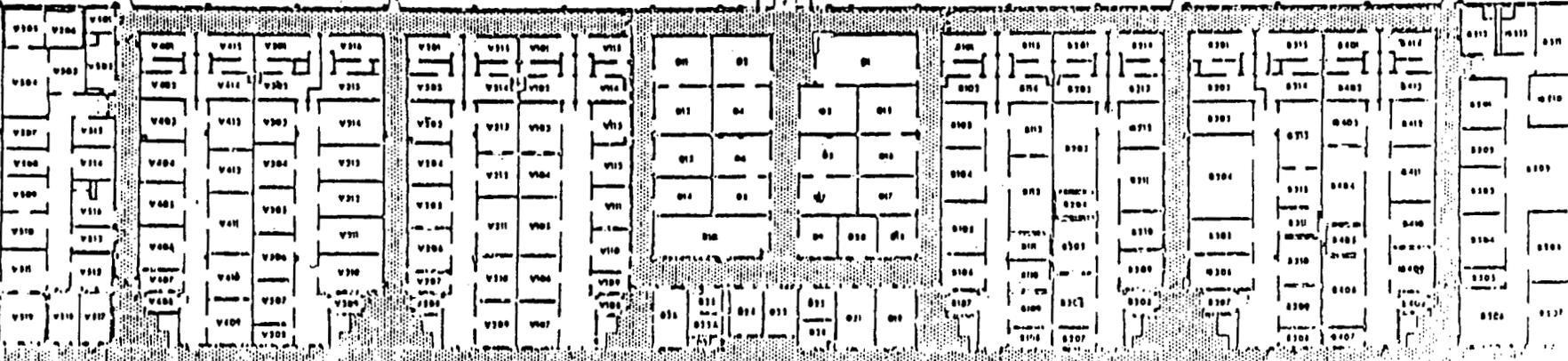
SUITE 1

SUITE 2

SUITE 3

SUITE 4

SUITE 5



SUITE 51

SUITE 41

SUITE 31

SUITE 2

SUITE 1

SUITE 1

SUITE 2

SUITE 3

SUITE 4

SUITE 5

ANIMAL ASSESSMENT DIVISION

CENTRAL SERVICES

ANIMAL RESOURCES AREA

S U P P L E M E N T    N O.   2

Items 15, 16 and 17, Form NRC-313(I), Renewal Application for NRC License  
No. 08-01738-03

1. Item 15, Radiation Protection Program:

a. Radiation Protection Officer's duties and responsibilities are enumerated in AR 40-37, "Medical Services - Licensing and Control of Radioactive Materials for Medical Purposes," Appendix B, 7 January 1977. See Inclosure 1 to this supplement.

b. Radiation Control Committee's duties and responsibilities are enumerated in the application for renewal of NRC Materials License - Medical, No. 08-01738-02, 18 July 1979, Tab 7.

c. The procedure for obtaining authorization to use radioactive material under Walter Reed Army Medical Center's Nuclear Regulatory Commission Licenses is enumerated in the application for renewal of NRC Materials License - Medical, No. 08-01738-02, 18 July 1979, Tab 8.

d. Operating and safety procedures for AECL Gammacell 220 Irradiator and Gammacell 40 Irradiator are attached as Inclosures 2 and 3 respectively to this supplement.

(1) Any proposed modifications to a Gammacell unit, including all proposed deviations from established operational or administrative procedures shall be submitted to WRAMC Radiation Control Committee. This committee shall review such proposals and determine whether or not they are advantageous to the operation of a Gammacell unit. All proposals will be classified in one of the following categories.

(a) Major Safety Change: Any change which affects the degree of hazard associated with the operation of an AECL Gammacell unit.

(b) Minor Safety Change: Any change not classified as a major change which is directly associated with the safety of a Gammacell unit. Included in this category are changes in the principal administration and operational procedures, health physics procedures and mechanical or electrical system alterations to a Gammacell unit.

(c) Routine Change: Changes which have no bearing on the safety characteristics of a Gammacell unit.

(2) All major and minor safety changes require the approval of the WRAMC Radiation Control Committee prior to requesting approval of proposed changes, through appropriate channels, from the Nuclear Regulatory Commission.

SUPPLEMENT NO.2 (Continued)

e. Leak testing procedures shall be performed in accordance with the applicable sections of HSHL-HP Standard Operating Procedure Number 1-6, "Leak Testing and Inventory of Sealed Sources," 16 July 1980 (Inclosure 4).

2. Item 16, Formal Training in Radiation Safety; and Item 17, Experience:

a. Individuals who will use or directly supervise use of licensed material specified in this application must be approved by the WRAMC Radiation Control Committee in accordance with the procedures delineated in the application for renewal of NRC Material License - Medical, No. 08-01738-02, 18 July 1979, Tabs 7 and 8.

b. A resume of the training experience for LTC William E. Woodward, Health Physics Officer, WRAMC, is attached as Inclosure 5 to this supplement.

ARMY REGULATION }  
No. 40-37

HEADQUARTERS  
DEPARTMENT OF THE ARMY  
WASHINGTON, DC, 7 January 1977

MEDICAL SERVICES  
**LICENSING AND CONTROL OF RADIOACTIVE MATERIALS  
FOR MEDICAL PURPOSES**

Effective 1 February 1977

*This is a complete revision of AR 40-37 and reflects the current requirements of the Nuclear Regulatory Commission as published in Title 10, Code of Federal Regulations, for the use and control of radioactive materials for medical purposes worldwide. Supplementation of this regulation is prohibited, except upon approval of The Surgeon General [HQDA (DASG-HCH) WASH DC 20310]. This regulation does not apply to the USAR and NBG.*

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1. Purpose. The purpose of this regulation is to—
  - a. Prescribe policies and procedures for the use and control of radioactive materials for medical purposes.
  - b. Prescribe procedures for obtaining Nuclear Regulatory Commission (NRC) licenses and amendments.
  - c. Prescribe procedures for obtaining Department of the Army (DA) radioactive material authorizations and amendments for radioactive materials not controlled or licensed by the NRC.

- d. Establish procedures for the reporting of radioactive materials used in medical programs.
2. Scope. This regulation—
  - a. Applies to all Army medical facilities producing, procuring, storing, possessing, shipping, transferring, using, and disposing of radioactive materials for medical purposes worldwide.
  - b. Does not negate or supersede any NRC or Food and Drug Administration (FDA) requirements pertaining to the control, safeguard, and use of radioactive materials for medical purposes.

*Partial*  
*29/5/80*

\*This regulation supersedes AR 40-37, 12 August 1963.

Incl 1 to Supl 2 to Item 15, Form NRC 313(I)

## APPENDIX B RADIATION PROTECTION OFFICER

**B-1.** The RPO is an individual designated by the commander to provide consultation and advice on the degree of hazards associated with radiation and the effectiveness of the measures to control these hazards. In addition, he will supervise the radiation protection program (AR 40-14).

**B-2.** Organizationally, the RPO will be in a position wherein he can effectively advise the commander and the radiation workers on all matters pertaining to radiation protection.

**B-3.** Responsibilities of the RPO will include, but not be limited to:

*a.* Providing the commander, Radioisotope/Radiation Control Committee and radiation workers with advice and assistance on all matters pertaining to radiation protection. This includes instructing and training of workers (users) and visitors in the safe use of protective equipment and radiation producing devices (AR 40-5 and AR 40-14).

*b.* Providing guidance on types of protective clothing and equipment required and its proper use (AR 40-5).

*c.* Reviewing radiological operations to determine compliance with regulations and approved procedures.

*d.* Reviewing or preparing SOP for operations involving sources of ionizing radiation prior to approval by the Radioisotope/Radiation Control Committee (AR 40-5).

*e.* Reviewing and approving the procurement of all radioactive material and radiation producing devices.

*f.* Insuring that proper personnel monitoring devices are used and that necessary bioassays are performed and required records are maintained of the results (AR 40-5 and AR 40-14).

*g.* Insuring that radiation survey/detection instruments used in radiation protection are properly calibrated and are available to radiation workers (AR 40-5 and TB 43-180).

*h.* Insuring that all radiation shields, containers and handling equipment are maintained in satis-

factory condition (AR 40-5).

*i.* Insuring the proper posting of any radiation warning signs (AR 385-30).

*j.* Maintaining a current inventory of radioactive materials and a registry of radiation producing devices.

*k.* Maintaining the required radiation protection records (AR 340-18-6).

*l.* Conducting a physical inventory of radioactive materials at least once every 3 months.

*m.* Performing radiation surveys and leak tests or insuring that such surveys and leak tests are performed. The accuracy of tests and surveys, if performed by others, remains the responsibility of the RPO (AR 40-5).

*n.* Evaluating the hazard potential and adequacy of protective measures for existing and proposed operations (AR 40-5).

*o.* Monitoring incidents wherein unusual levels of radiation or radioactive contamination are suspected (AR 40-5).

*p.* Insuring that all radioactive materials are properly used, stored, handled, shipped and disposed of in accordance with applicable directives (AR 40-5).

*q.* Formulating and implementing the radiation protection program.

*r.* Investigating radiation accidents/incidents and overexposures to determine the cause and taking steps to prevent recurrence (AR 40-5 and AR 40-14).

*s.* Terminating a project or procedure involving the use of radioactive material or radiation producing device which is found to be a threat to health or property.

**B-4.** The RPO will act as executive agent for all NRC licenses and DA radioactive material authorizations for the possession, use and storage of radioactive material.

**B-5.** The RPO should be a member of the following installation/activity committees if such committees have been established (the name of the committees may vary):

- a. The Radioisotope/Radiation Control Committee (AR 40-14).
- b. The reactor Safeguards Committee (AR 385-80).
- c. The Safety and Health Committee (AR 385-10).

- d. The Accelerator Facility Safety Committee.
- e. The Human Use Committee, if radioactive material is used (AR 40-38).
- f. The Clinical Investigation Committee, if radioactive material is used (AR 40-38).
- g. The Radioactive Drug Research Committee.

HEALTH PHYSICS  
WALTER REED ARMY MEDICAL CENTER  
Washington, D.C. 20012

SOP Number

OPERATING AND SAFETY PROCEDURES FOR  
AECL GAMMACELL 220 IRRADIATOR

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1. GENERAL

a. The Gammacell 220 (GC-220) shall be used (operated) by, or under the direct supervision of individuals designated by the Walter Reed Army Medical Center (WRAMC) Radiation Control Committee, Deputy Commander, WRAMC, Chairman.

b. The authorized Principal User is directly responsible for the control and safe use of this irradiator and will designate individuals to operate the GC-220 as approved by the WRAMC Radiation Control Committee.

c. The GC-220 shall be used for medical research and development in radiation biology and radiation dosimetry.

2. DEFINITIONS

Because the precise meaning given to one or more critical terms frequently determines the interpretation of a statement, the following definitions are given for certain words and phrases as they are used in this document:

a. "Shall" - denotes that the ensuing recommendation is necessary or essential to meet the currently accepted standards of radiation protection.

b. "Should" (is recommended) - indicates advisory recommendations that are to be applied when practicable.

c. "Explosive" - explosives are either solid or liquid, either mixtures or single compounds, and act by explosive chemical reaction, liberating at high speed heat and gas, which causes tremendous pressure.

d. "Flammable" - materials capable of being easily ignited; preferred to "inflammable" because of possible ambiguity of the in prefix.

SOP Number

e. "Individual" and/or "Operator" - a person designated by the authorized Principal User as approved by the WRAMC Radiation Control Committee, to operate the AECL Gammacell 220 Irradiator.

f. "Emergency" - an unforeseen combination of circumstances (e.g., failure of an interlock or safety device, fire, ruptured or leaking source, etc.) that poses a threat to personnel or property by ionizing radiation.

### 3. RESPONSIBILITIES

#### a. The authorized Principal User:

(1) Ensuring that the GC-220 is operated only by individuals authorized to do so by the WRAMC Radiation Control Committee and in accordance with the conditions of WRAMC Radioactive Material Authorization.

(2) Instruction of individuals in safe operating procedures in accordance with instructions outlined herein. He shall promulgate rules for working safety, including any restrictions of the operating technique known to be necessary.

(3) Ensuring that these instructions and references contained in para 7 are available at the GC-220 unit at all times.

(4) Promptly reporting any source malfunction, accident, or other unplanned occurrence that could result in an unsafe condition or exposure to personnel to the WRAMC Health Physics Officer (301-427-5107).

(5) Assure that all personnel operating the unit are monitored by appropriate personnel monitoring devices.

(6) Assure that personnel operating the unit have been instructed in the hazards and nature of injuries resulting from overexposure to ionizing radiation [e.g., attendance at appropriate WRAMC personnel training programs (HSWP-QHP Memo #2)].

#### b. WRAMC Health Physics:

(1) Conducting routine radiation protection surveys and inspections.

(2) Providing technical assistance as required.

(3) Providing calibration and routine maintenance services for radiation detection and measuring instruments required in WRAMC Radioactive Material Authorization.

#### c. Individual Operators:

(1) Operating the unit in accordance with the operation and safety procedures delineated in this SOP.

SOP Number

(2) Recording all pertinent information in the operating log maintained by the authorized Principal User.

(3) Being familiar with the content of these instructions, requirements of the WRAMC authorization, and other regulations as may be prescribed by the authorized Principal User.

(4) Locking the GC-220 unit and the room upon completion of use.

(5) Ensuring that the keys to the unit and the room door are properly secured to prevent unauthorized use.

(6) Reporting all malfunctions, accidents, and any other unplanned occurrence that could result in an unsafe condition or exposure of personnel promptly to the authorized Principal User.

#### 4. OPERATING PROCEDURES.

a. Insert key in keyswitch and turn clockwise 90°.

b. Raise the drawer by pressing the UP rocker switch.

c. To open the collar doors, press and hold in the button on the top of the door interlock, grasp the right hand door handle, pull back the latch lever, release the button and pull the doors open.

d. Slide the sample chamber locking ring to the right, remove the door by lifting it up and outwards.

e. Place the sample in the chamber. The access tube in the drawer top accommodates accessory tubes and electrical leads, which should be fitted in accordance with the instructions provided in the Gammacell 220 Accessories Manual.

f. Replace the sample chamber door with a forward and downward motion. Move the locking ring to the left until it snaps into position. If difficulties are experienced, check that the door is correctly positioned in the port.

g. To close the collar doors, press and hold in the button on the top of the door interlock. Grasp the right hand door handle, pull back the latch lever, release the button and push the doors closed.

h. If automatic operation is desired set the irradiation time in the following manner:

(1) Push the timer reset knob, turn it clockwise 90°, and release; the white line on the knob should be horizontal.

(2) Open the hinged cover which protects the predetermining drums; turn the knurled wheels either direction until the desired number sequence appears in the windows.

SOP Number

(3) Rotate the selector switch to hours, minutes or seconds. Close the hinged cover and turn the timer reset knob counterclockwise; the white line on the knob should be vertical, press the reset knob to set the timer.

(4) Push the DOWN switch. The drawer will lower to the irradiating position, activate the timer, and remain there until the preset time interval has elapsed, when it will automatically raise.

i. If manual operation is desired rotate the selector switch to MANUAL and press the DOWN switch. The drawer will lower and remain there indefinitely until the UP switch is operated.

j. To remove the sample repeat steps b - d.

5. SAFETY FEATURES

There are a variety of safety features incorporated into the unit for the protection of the operator.

a. Three microswitches are mounted on the collar door to ensure that:

(1) The sample chamber door is properly located.

(2) The locking ring is in position.

(3) Both collar doors are closed.

b. A fourth microswitch is located on the top shielding plug to ensure that the plug is closed.

c. Unless all four microswitches are actuated the drive motor will not start.

d. The self-locking feature of the worm gear reducer acts as a brake to prevent the drawer moving down under its own weight.

e. A solenoid-operated ram prevents the sample drawer from moving down in the event of a drive system mechanical failure.

f. Drawer movement can be arrested by switching off the electrical supply key switch.

g. A solenoid-operated door interlock ensures the collar doors can only be opened with the drawer in the safe position.

h. Top plug rest and safety column ensure the top plug can only be opened with the drawer in the full up position.

6. SAFETY/EMERGENCY PROCEDURES

a. The GC-220 shall be operated as described in the Atomic Energy of Canada Limited "Operator's Manual for the Gammacell 220 Cobalt 60 Irradiation Unit," edition 7, February 1978, and in accordance with this Standard Operating Procedure.

SOP Number

- b. Emergency Procedures: See Annex A of this Standing Operating Procedure.
- c. No individual shall undertake repair, perform any maintenance, remove any interlock and/or safety device, or make any changes in and/or on the GC-220 without prior approval of the authorized Principal User and the Health Physics Officer, WRAMC.
- d. Under NO circumstances shall explosive material be irradiated in the GC-220.
- e. All operators and/or assistants shall wear personnel monitoring devices while working around and/or operating the GC-220 Irradiator.
- f. Health Physics, WRAMC, will perform leak tests, periodic inspections and radiation protection surveys.
- g. An operating log shall be maintained by the authorized Principal User.
- h. Key Control:
  - (1) Operating keys will be held under direct supervision of the authorized Principal User approved by the WRAMC Radiation Control Committee. The Principal User is responsible for assuring proper key control and key security.
  - (2) Duplicate keys for the GC-220 and GC-40 will be secured by the authorized Principal User.

## 7. REFERENCES

- a. Atomic Energy of Canada Limited "Operator's Manual for the Gammacell 220 Cobalt 60 Irradiation Unit," edition 7, February 1978.
- b. Nuclear Regulatory Commission By-Product Material License No. 08-01738-03.

1 Incl  
ANNEX A - Emergency Procedures  
for AECL Gammacell  
220 Irradiator

ANNEX A to Health Physics SOP Number

EMERGENCY PROCEDURES  
FOR  
AECL GAMMACELL 220 IRRADIATOR

1. In the event of an emergency, malfunction, or other unusual occurrence, the following individuals shall be notified after turning the console to the OFF position:

- a. Authorized Principal User, WRAIR, Extension 576-3428.
- b. Radiation Protection Officer, WRAIR, Extension 576-3428.
- c. Health Physics Officer, WRAMC, Extension 301-427-5107.
- d. Staff Duty Officer, WRAMC (after duty hours), Extension 576-3501/2309.

The senior individual at the site shall clear the area of personnel and restrict access to the area until relieved by competent authority.

2. In the event of a fire, the following individuals shall be notified:

- a. Fire Department, WRAMC, Extension 576-3317.
- b. Authorized Principal User, WRAIR, Extension 576-3428.
- c. Radiation Protection Officer, WRAIR, Extension 576-3428.
- d. Health Physics Officer, WRAMC, Extension 301-427-5107.
- e. Staff Duty Officer, WRAMC (after duty hours), Extension 576-3501/2309.

The senior individual at the site shall clear the area of personnel and restrict access to the area until relieved by competent authority. Fire fighters may enter the area after the radiation hazard has been determined. There is little likelihood of radiation hazard unless the temperature of the source shield reaches the melting point of lead (621°F). Water should be sprayed on the source shield if there is any possibility of the temperature approaching this value.

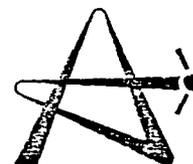
3. Following an emergency the GC-220 shall not be operated until an inspection and a radiation protection survey have been conducted by WRAMC Health Physics.

OPERATOR'S MANUAL  
for the  
GAMMACELL 220  
cobalt 60 irradiation unit

serial numbers 160 and subsequent

EDITION 7  
FEBRUARY 1978

2M002053



ATOMIC ENERGY OF CANADA LIMITED  
COMMERCIAL PRODUCTS

P.O. Box 6300, Station J, Ottawa, Canada, K2A-3W3

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## GENERAL

The Gammacell 220 is a Cobalt 60 irradiation facility manufactured by Atomic Energy of Canada Limited for use in an unshielded room. Figure 1 illustrates the external features and Figure 2 the general dimensions of the unit.

The unit basically consists of an annular source (see Figure 3) permanently enclosed within a lead shield, a cylindrical drawer, and a drive mechanism to move the drawer up or down along the source centre-line. The drawer has a chamber to carry samples to be irradiated from outside the shield to the source.

Samples up to approximately six inches in diameter and eight inches in height can be accommodated in the chamber. Liquid, gaseous, electrical or mechanical connections can be introduced into the sample chamber through an access tube in the upper portion of the drawer. An electrically powered digital timer automatically raises the drawer at the termination of a sample irradiation. Times may be preset to a maximum of 999.9 hours.

## ELECTRICAL

The Gammacell 220 operates on a 220 volt, 3 phase, 50/60 Hertz, 15 ampere supply. The supply is connected through a starter to a  $\frac{1}{2}$  hp drive motor. A step-down transformer connected across one phase of the supply provides the 115 volt, 1 ampere control circuit requirement.

## WEIGHT

Crated	8,500 lb (3856 kg)
Uncrated	8,300 lb (3765 kg)

## HEAD

The head (see Figure 1) serves as a cylindrical shield for the source and as a guide for the moving drawer. It consists of a leak-proof shaped cylinder which contains approximately six thousand pounds of lead to provide ten inch thick shielding.

A stepped, circular hole running vertically through the centre of the head locates the inner head plug, the source cage assembly and the moving drawer.

#### COLLAR

Mounted on top of the head is a  $6\frac{1}{2}$  inch (16.51 cm) deep lead filled annular steel collar. The collar provides shielding for the transient beam occurring when the relatively unshielded volume of the sample chamber moves through the inner plug. The rear, semi-circular portion of the collar is attached to the head. The front portion opens as two doors, each hinged to the rear portion of collar. Pressure on a lever behind the handle on the right door raises a latch and permits the overlapping doors to be opened. The doors can be opened only when the drawer is raised, when access is required to the sample chamber.

#### INNER HEAD PLUG

The inner head plug is a lead filled steel cylinder which fits into the head above the source cage. It forms part of the shielding and also houses the upper drawer guides. The plug must not be removed except for source changing procedures supervised by A.E.C.L. staff.

#### SOURCE CAGE ASSEMBLY

The source cage is located in the centre of the head directly beneath the inner head plug. The stainless steel cage contains forty-eight double-sealed source pencils, each 8.31 inches (21.11 cm) long, set in an annular formation on an 8.32 inch (20.91 cm) pitch circle diameter (see Figure 3). Each tubular pencil contains seven Cobalt 60 slugs completely sealed in by welded end caps.

The inside diameter of the cage is sufficiently greater than the diameter of the drawer to prevent excess radiation leakage through the clearance between the drawer and head.

## DRAWER

The drawer moves vertically through the centre of the head, inner plug and source cage assembly. It is 59.0 inches (149.86 cm) long and  $6\frac{1}{2}$  inches (16.51 cm) in diameter, and is constructed from four distinct components; the top shielding plug, the drawer top, the sample chamber and the drawer bottom. The top shielding plug is hinged to the drawer top. The other three components are keyed together to ensure mechanical alignment and secured with screws. The drawer is guided in the head and inner head plug by four bronze bearings.

## TOP SHIELDING PLUG

The lead filled closed steel cylindrical plug is 4 inches (10.16 cm) in diameter and  $5\frac{1}{4}$  inches (13.34 cm) long. It is hinged to a steel casting on the drawer top and provides a radiation shield over the drawer top access tube. When the drawer is raised the top plug may be tilted back to permit the introduction of accessories into the sample chamber, see Figure 5. Electrical interlocks prevent the drawer being lowered with the plug in the open position. During a sample irradiation procedure the plug cannot be opened.

## DRAWER TOP

The  $6\frac{1}{2}$  inch (16.51 cm) diameter,  $14\text{-}\frac{3}{8}$  inch (36.51 cm) long closed stainless steel cylinder has a  $1\frac{1}{4}$  inch (3.17 cm) inside diameter access tube through its centre. The space between the stainless steel outer casing and the stainless steel access tube is filled with lead. Welded to the drawer top is a steel casting onto which the top shielding plug is hinged. The casting is shaped to provide indirect entry to the access tube; it also provides two sockets tapped  $\frac{1}{2}$  - 20 UNF - 2B,  $\frac{3}{4}$  inch (1.91 cm) deep to accommodate accessory mounting posts. The access tube has a one inch (2.54 cm) deep,  $1\text{-}\frac{3}{8}$  -12-2B female thread to accept the tube insert accessory assembly.

### SAMPLE CHAMBER

The chamber is a thin wall closed, non-corrosive metal cylinder with a lift out full width door. The inside dimensions of the chamber are 6.10 inches (15.49 cm) diameter and 8.06 inches (20.47 cm) high. The access port is 7.91 inches (20.07 cm) high and 6.00 inches (15.24 cm) wide. A step on the bottom of the door and a locking ring at the top of the chamber retain the door in place, see Figure 4. An opening is provided in the top and bottom of the chamber for the access and drain tubes. Electrical interlocks prevent drawer movement when the door or door latch is improperly closed.

### DRAWER BOTTOM

The drawer bottom is formed from a 6.5 inch (16.51 cm) diameter, 30.5 inch (77.47 cm) long stainless steel tube, lead filled, and closed at both ends. A spiral stainless steel drain tube, 7/16 inch (1.11 cm) internal diameter, runs the length of the drawer bottom to facilitate drainage of liquid spills in the sample chamber. The drawer bottom is sufficiently long enough to provide irradiation shielding beneath the source chamber when the drawer is up or down.

A rectangular bracket on the base of the drawer provides a pin joint connection to the drive mechanism.

### DRIVE MECHANISM

The drawer assembly is raised or lowered by a chain and sprocket system (see Figure 6). The system motive power is provided by a  $\frac{1}{4}$  hp, 220 volt, 3 phase motor; the output speed of which is reduced initially through a V-belt and pulley connection to a worm and gear reducer. Further speed reduction is obtained through a chain and sprocket drive to a shaft. A sprocket at each end of the shaft transmits the shaft rotation to the smaller of double head sprockets mounted each side of the head base. The head sprockets rotate less than one revolution each complete up or down movement of the drawer. Two roller chains are pinned at one end to each of the larger of the double head sprockets and at the other end to each end of a full width T-bar.

The T-bar is pin jointed to a bracket on the bottom of the drawer. With the partial rotation of the head sprockets on upward drawer movement the lift chains wrap around the sprockets and raise the T-bar.

#### DRAWER MOVEMENT

Drawer movement is electrically governed by the control panel. Microswitches mounted on the head sprockets are cam actuated, Figure 7, before the end of drawer travel and disconnect the electrical supply to the motor. The momentum of the drawer carries it the remaining distance to the mechanical stops. The drawer travels 19.72 inches (50.02 cm) in approximately seven seconds. Microswitches S10 and S15 provide a back up to these cam operated microswitches.

Mechanical stops are provided at the limits of the drawer movement. The upper stop is formed from an adjustable bolt, mounted on the underside of the shield head, which stops against a nylon pad inserted in the top side of the T-bar. The lower stop is formed from a nylon tipped adjustable bolt, mounted on a fixed bracket (see Figure 7), which stops against the underside of the drawer when it reaches the lowest point of its movement.

A hand crank is provided to enable the drawer to be operated manually in the event of a power supply failure.

#### CONTROL PANEL

The unit controls are grouped on one panel situated at the top right of the head, as illustrated in Figure 8. From the top of the panel the controls are:

1. Digital timer - to provide irradiation time settings to a maximum of 999.9 hours. A reset button returns the timer to its original setting. The timer commences operation when the drawer reaches the irradiation position.
2. Selector switch - to provide for manual operation or selection of time settings in seconds, minutes or hours.

3. Movement switch - to select up or down drawer movement.
4. Key switch - to control the electrical supply to the unit control circuit.

#### SAFETY FEATURES

For the protection of the operator several safety features have been incorporated in the unit.

Three microswitches are mounted on the collar door (Figure 9) to ensure that:

- a) the sample chamber door is properly located.
- b) the locking ring is in position.
- c) both collar doors are closed.

A fourth microswitch is located on the top shielding plug to ensure that the plug is closed. Unless all four microswitches are actuated the drive motor will not start.

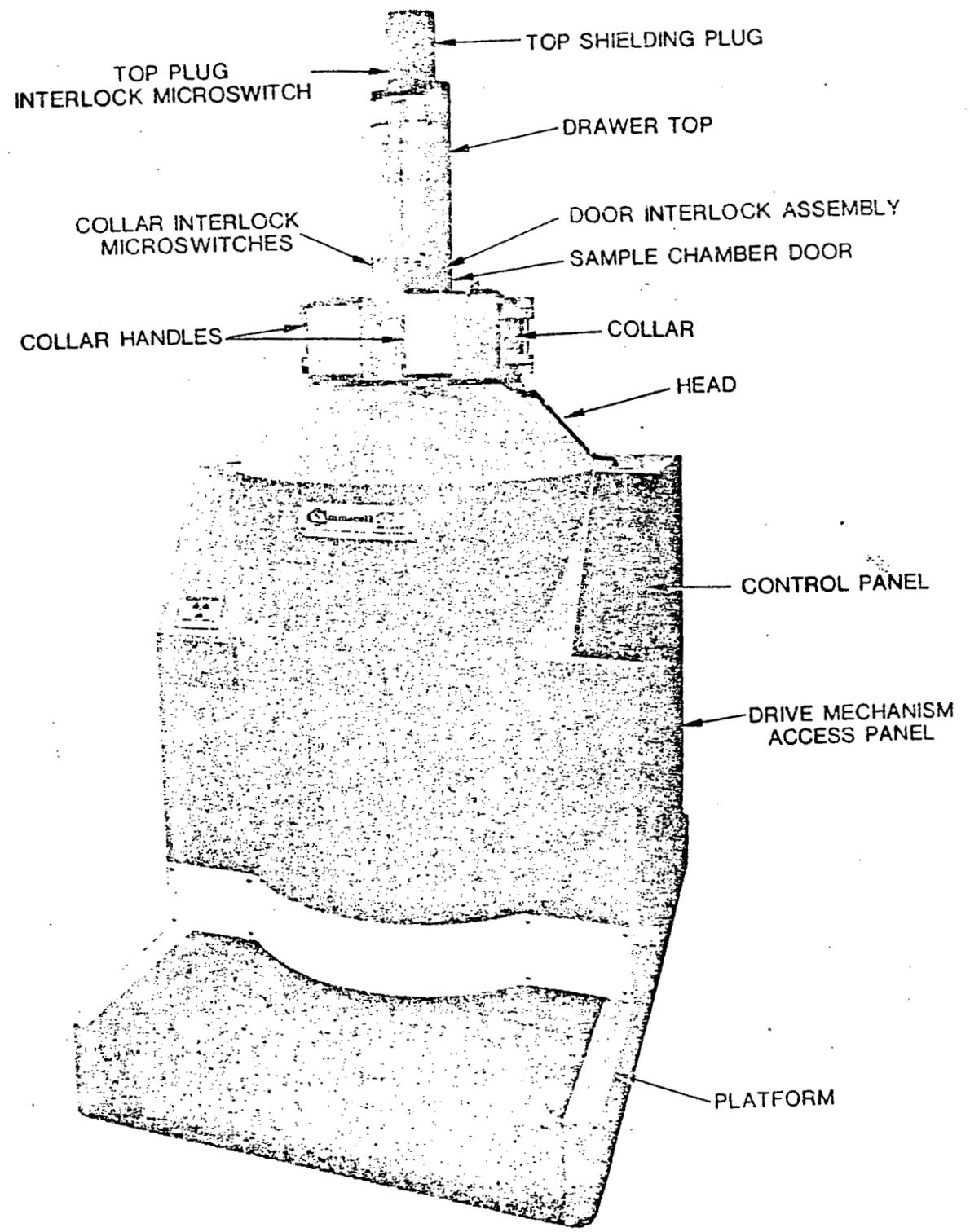
The self-locking feature of the worm gear reducer acts as a brake to prevent the drawer moving down under its own weight.

A solenoid operated ram, mounted on the underside of the head, actuates when the drawer stops in the raised position. The ram locates against a rectangular bracket on the drawer bottom and prevents the drawer moving down in the event of a drive system mechanical failure.

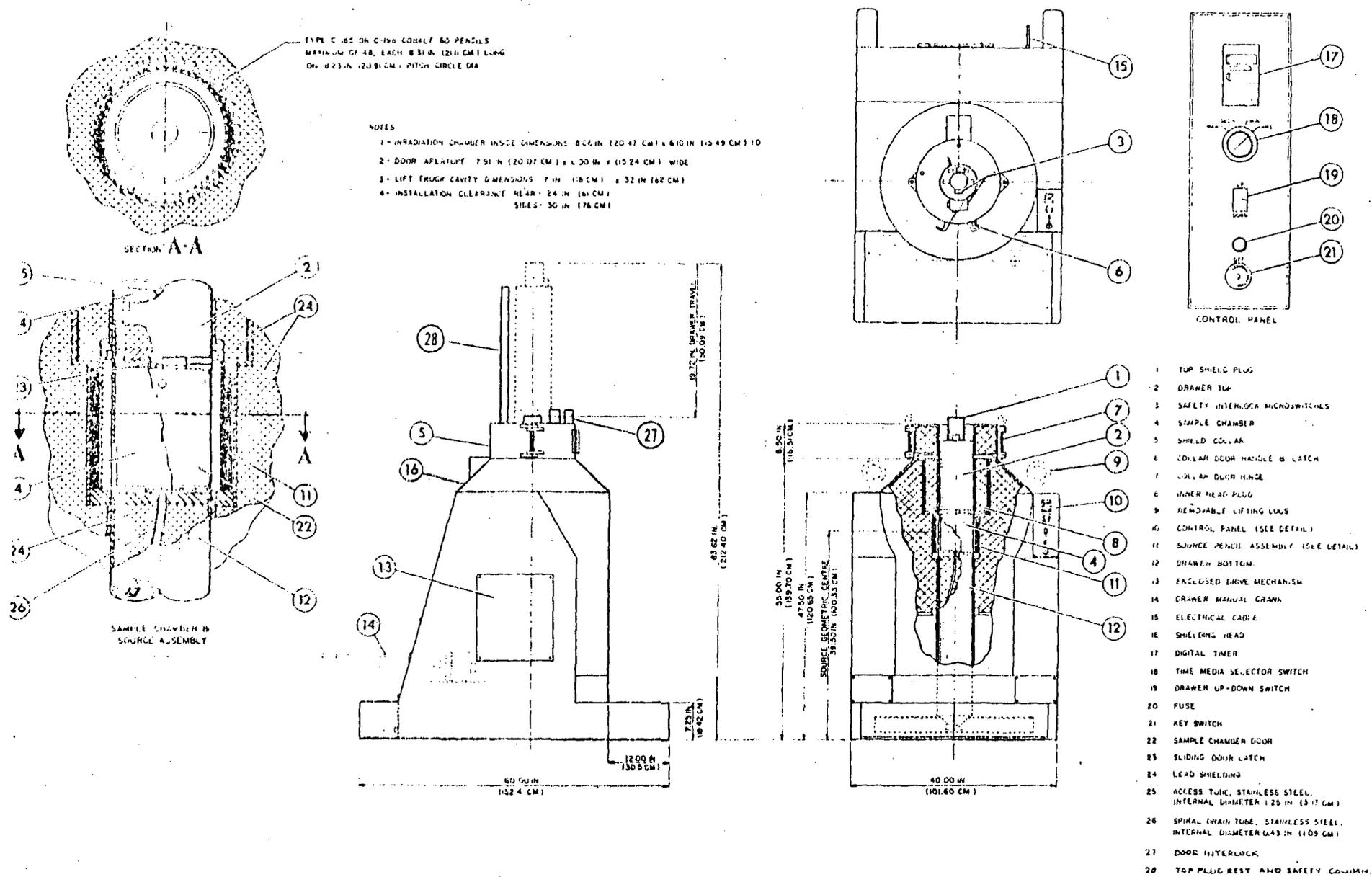
Drawer movement can be arrested by switching off the electrical supply key switch.

A solenoid operated door interlock ensures the collar doors can only be opened with the drawer in the safe position.

Top plug rest and safety column ensure the top plug can only be opened with the drawer in the full up position.

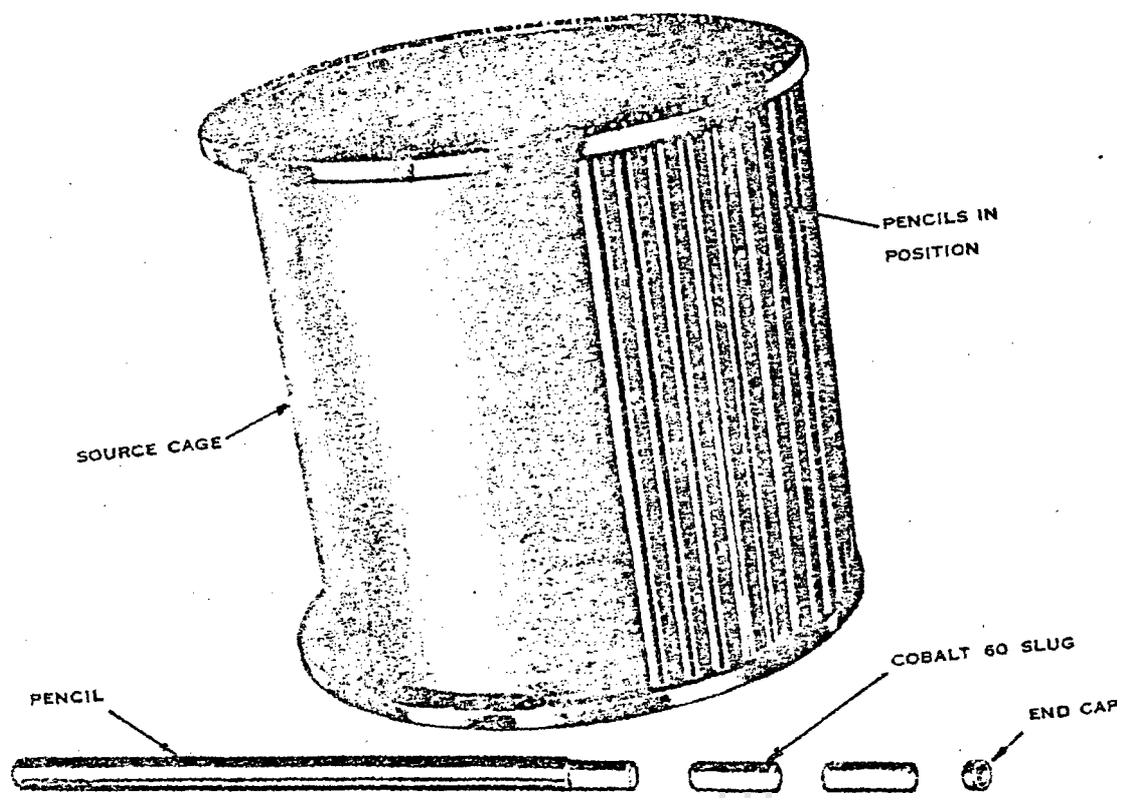


OVERALL VIEW OF GAMMACELL 220

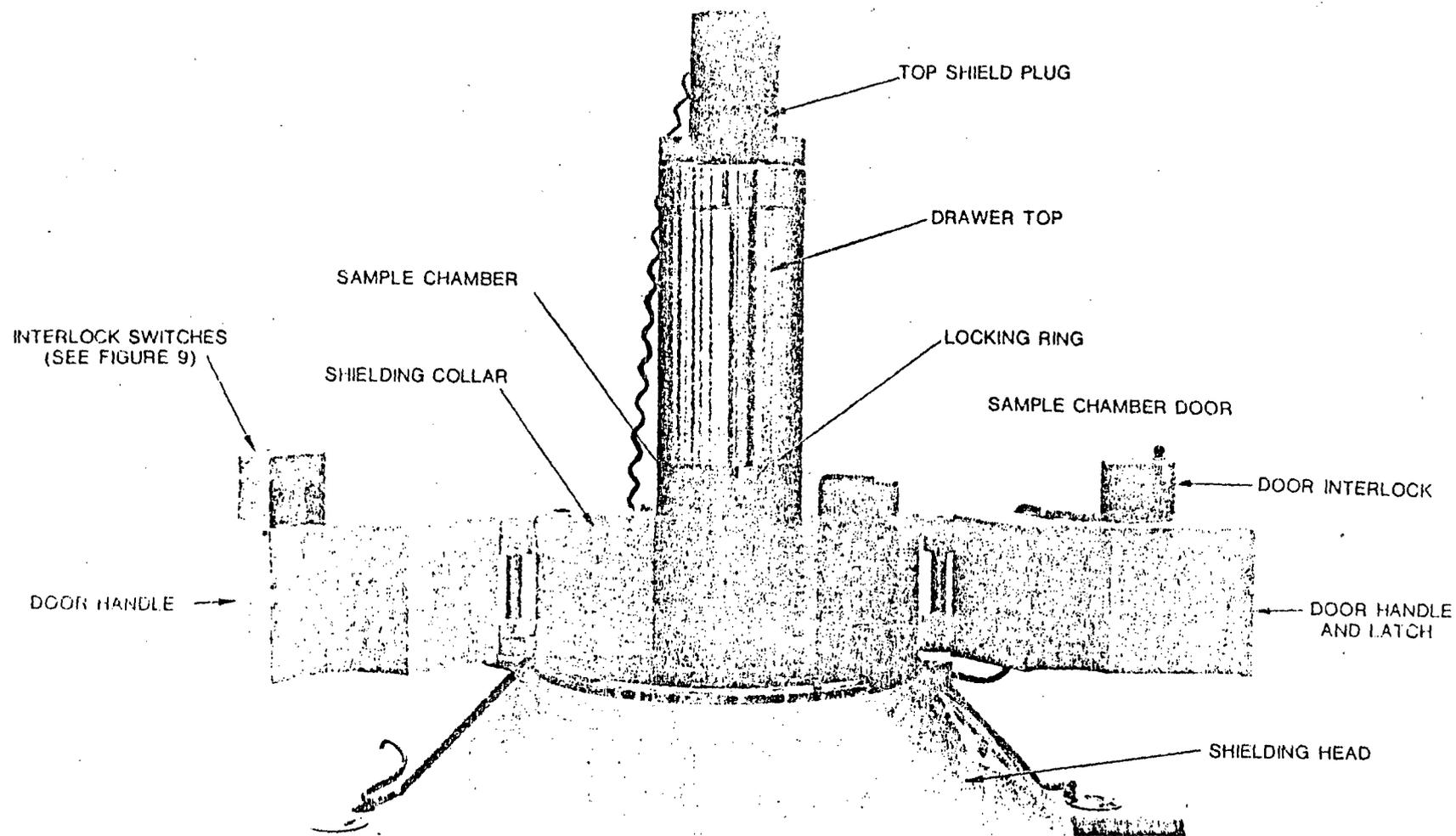


GAMMACELL-220 - GENERAL DIMENSIONS

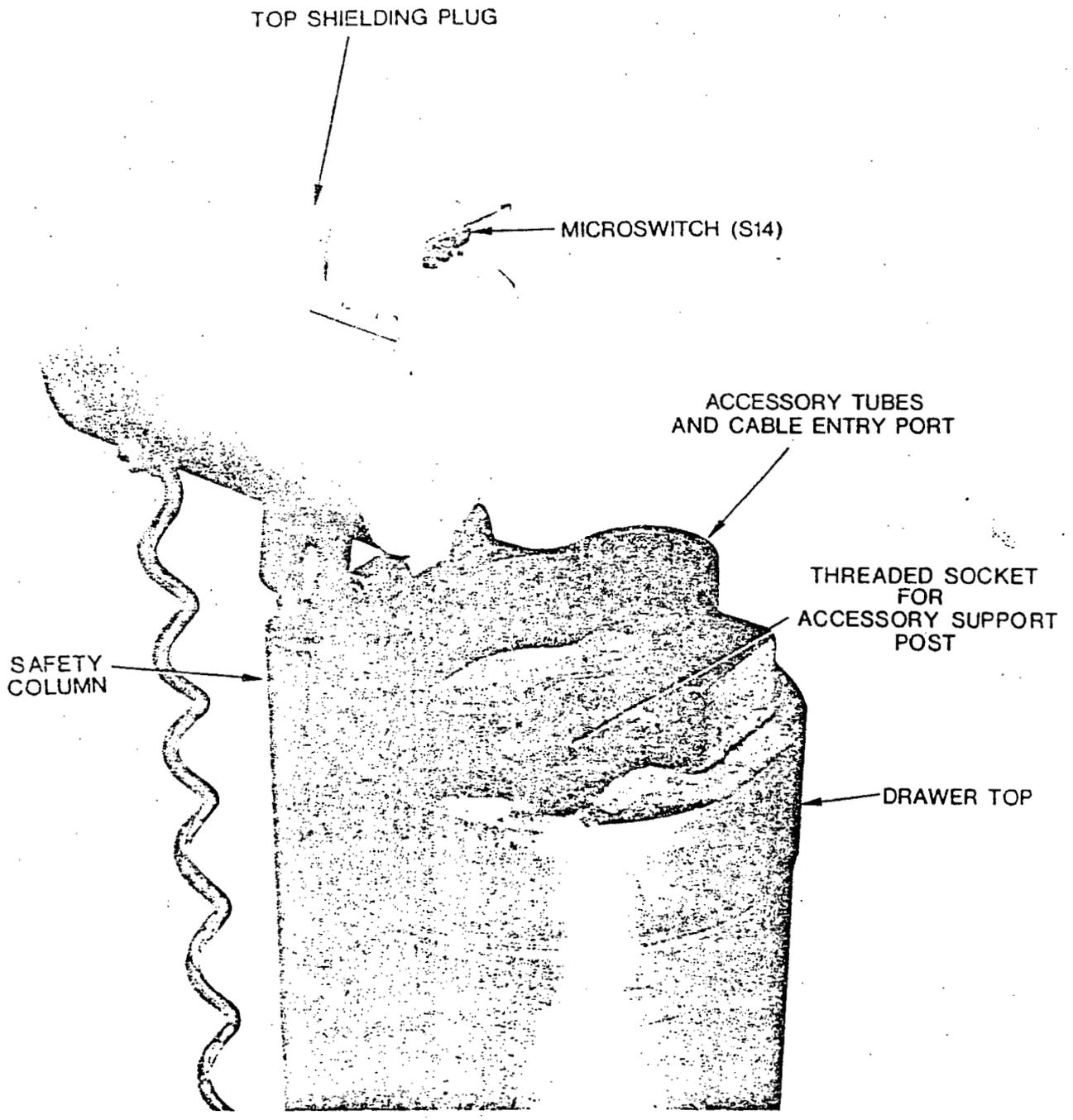
FIGURE 2



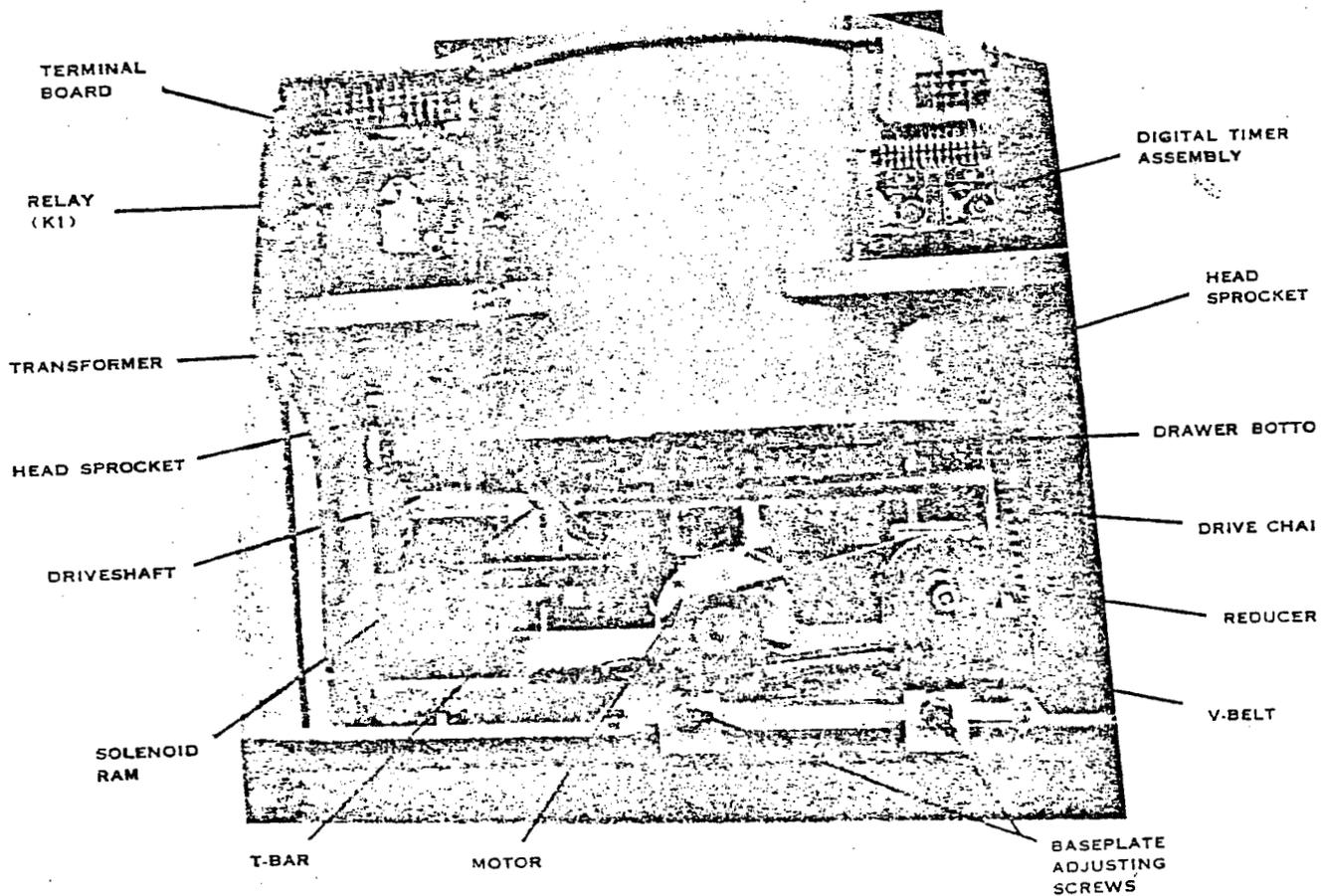
SOURCE PENCILS AND CAGE



COLLAR AND SAMPLE CHAMBER  
FIGURE 4

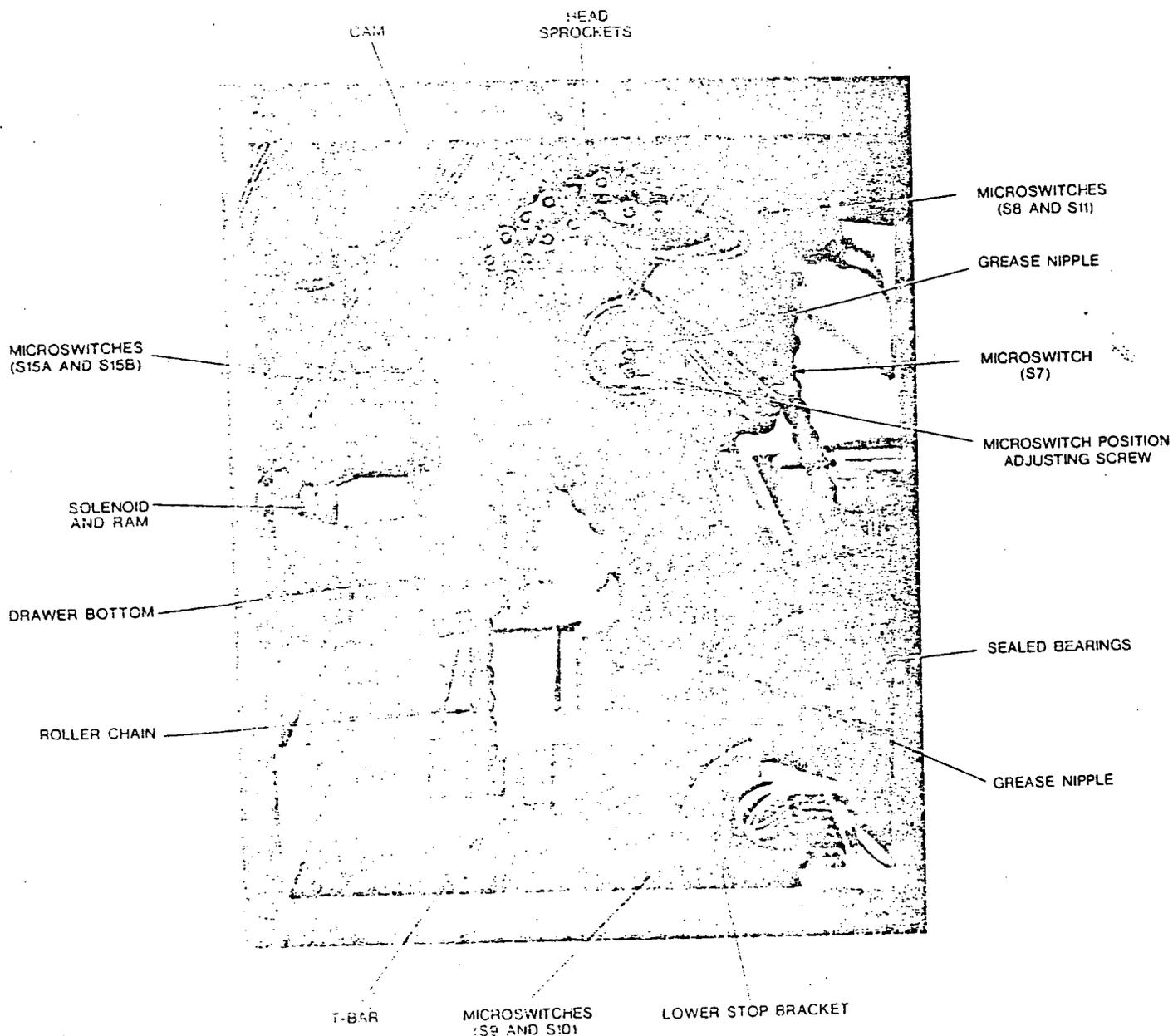


TOP SHIELDING PLUG  
FIGURE 5

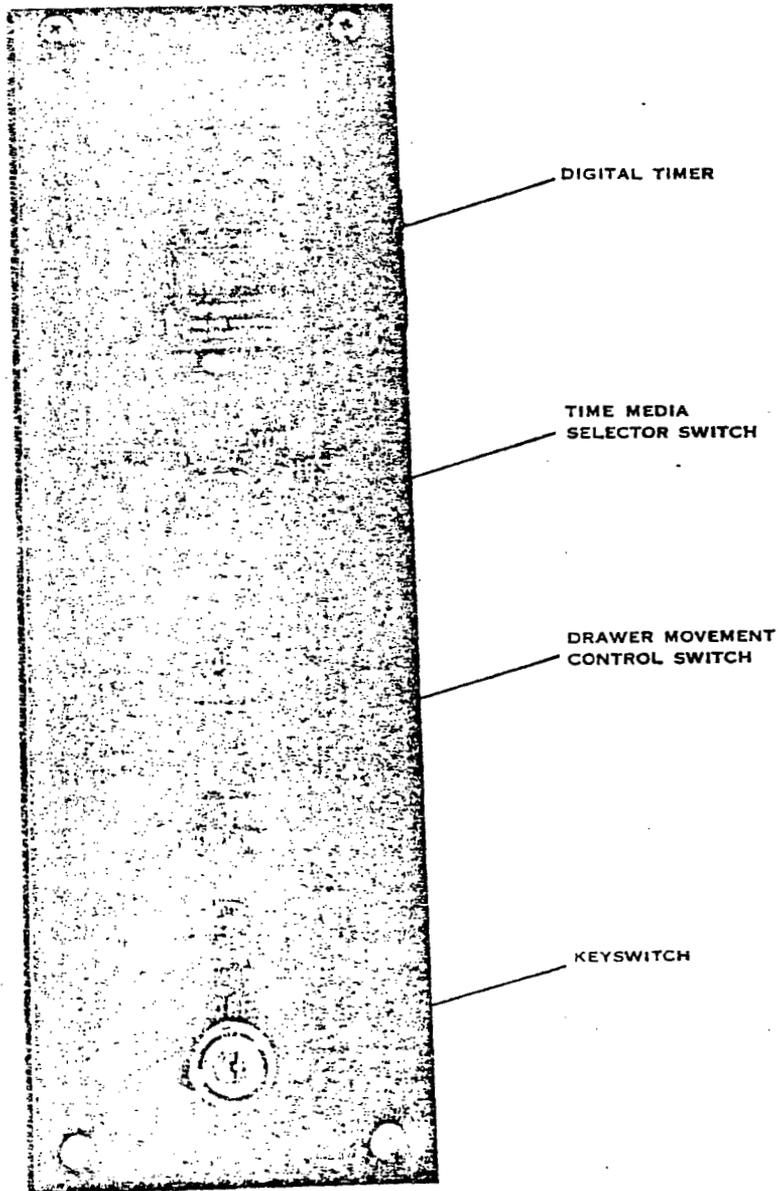


REAR OF UNIT

FIGURE 6



DRIVE MECHANISM  
FIGURE 7



CONTROL PANEL

FIGURE 8

## PART 2

## OPERATION

The Gammacell 220 has been designed to enable operation with minimum exposure to radiation. To ensure protection, operators should adhere to the following procedures.

## AUTOMATIC OPERATION

1. Raise the drawer by first inserting the key in the key switch and turning it 90° clockwise, then press the UP rocker switch. Press and hold the button on top of the door interlock.
2. To open the collar doors, press and hold in the button on the top of the door interlock, grasp the right hand door handle, pull back the latch lever, release the button and pull the doors open.
3. Slide the sample chamber locking ring to the right, remove the door by lifting it up and outwards.
4. Place the sample in the chamber. The access tube in the drawer top accommodates accessory tubes and electrical leads, which should be fitted in accordance with the instructions provided in the Gammacell 220 Accessories Manual.

NOTE: Materials expected to change state during irradiation should be placed in suitable containers.

Liquids expected to expand or boil should be provided with secondary containers for overflow, or vented to one of the access tubes.

The sample chamber and source cage will not withstand repeated spills or corrosive materials.

5. Replace the sample chamber door with a forward and downward motion. Move the locking ring to the left until it snaps into position. If difficulties are experienced, check that the door is correctly positioned in the port.
6. To close the collar doors, press and hold in the button on the top of the door interlock. Grasp the right hand door handle, pull back the latch lever, release the button and push the doors closed.
7. Set the required irradiation time on the digital timer in the following manner. (Refer to Figure 8).

- a) Push the timer reset knob, turn it clockwise 90°, and release; the white line on the knob should be horizontal.
  - b) Open the hinged cover which protects the predetermining drums; turn the knurled wheels either direction until the desired number sequence appears in the windows.
  - c) Rotate the selector switch to hours, minutes or seconds. Close the hinged cover and turn the timer reset knob counterclockwise; the white line on the knob should be vertical, press the reset knob to set the timer.
8. Push the DOWN switch. The drawer will lower to the irradiating position, activate the timer, and remain there until the preset time interval has elapsed, when it will automatically raise.
  9. To remove the sample repeat steps 2 and 3.

MANUAL OPERATION

1. For initial set-up read the preceding steps 2 to 6.
2. Rotate the selector switch to MANUAL.
3. Press the DOWN switch. The drawer will lower and remain there indefinitely until the UP switch is operated.

POWER FAILURE

In the event of a power failure the timer will stop and it will be necessary to raise the drawer manually.

1. Turn the key switch to the OFF position.
2. Spring out the large round button near the lower right corner of the back cover.
3. Push the crank (Figure 2, item 14) through the hole until it snaps into the extension on the input shaft of the reducer.
4. Crank in a clockwise direction to raise the drawer.

## NOTE:

1. If it is necessary to change an operation time do not alter the digit settings while the drawer is down and the timer is operating. Raise the drawer and set the timer as described in AUTOMATIC OPERATION, step 7.
2. On completion of a timed operation the timer can be reset to the same operation time by depressing the reset knob.
3. If it is required that the drawer be raised during an operation the timer will store the remaining portion of the preset time until the operation is resumed.

PART 3  
MAINTENANCE

The back and both side panels are removable, and provide access to the drive mechanism.

PREVENTIVE

Every six months. (Refer to Figures 6 and 7).

1. Motor - the motor is sealed and lubricated for life.
2. Worm Gear Reducer - the reducer is sealed and lubricated for life.
3. Shaft Bearings - apply a good quality bearing grease to the grease nipples on both sealed bearings and both sets of head sprockets. Do not use oil.
4. Chains - wipe with an oil-soaked cloth.

GENERAL

Mechanical - Collar Doors

The collar doors are adjusted to be as close as possible to the top surface of the inner head plug. If they become difficult to open (appear to drag), turn the adjusting screw on the underside of the hinges inward until the doors will move freely.

V-Belt

Check the V-belt periodically for signs of wear. Belt tension should be such that the total vertical belt deflection midway between the motor and the reducer is approximately one-half inch (1.27 cm). If adjustment is required, loosen the four motor mounting screws and move the motor to suit. If the belt is too loose the motor drive sprocket will slip and not transmit movement to the drawer.

Chains

Prior to adjusting the roller chain, raise the drawer, switch off the electrical supply and crank the drawer down until it rests on the bottom stop. After adjustments are made and all bolts are tightened, crank the drawer back to the raised position.

The reducer output chain may become slack due to initial stretching under load. Depending on the position of the drawer one side of the chain will always be taut, but the other side may be slack. If the total movement play on the slack side is more than  $\frac{1}{4}$  inch (1.27 cm), loosen the four baseplate mounting bolts, tighten the two baseplate adjusting screws and then the mounting bolts.

When necessary, adjust the sealed bearing brackets to tighten the chains between the shaft and head sprockets. This operation will slacken the reducer output chain which will then require re-adjustment of the baseplate.

#### MECHANICAL STOPS

The lower stop (Figure 7) is adjusted so that the geometric centre of the sample chamber corresponds with that of the source assembly when the drawer is lowered to the irradiating position. Because of the wear on chains and the stop this position should be checked once a year. When the drawer is in the irradiating position the V-groove near the top of the drawer top should line up with the top surface of the inner head plug. The manual crank should be used to position the drawer, then the threaded stop adjusted to suit.

The upper stop should be adjusted so that the sample chamber door is easily removed. It is initially adjusted to position the chamber door sill approximately  $\frac{1}{4}$  inch (0.64 cm) above the inner plug top surface.

#### CHAMBER DOOR

If the locking ring is difficult to move, the plunger may be adjusted by turning it inward.

#### ELECTRICAL -

##### Microswitches

There are ten microswitches on the unit:

S4 - bracket mounted on the left collar door (see Figure 9), the switch is actuated by the right door when the collar doors are closed.

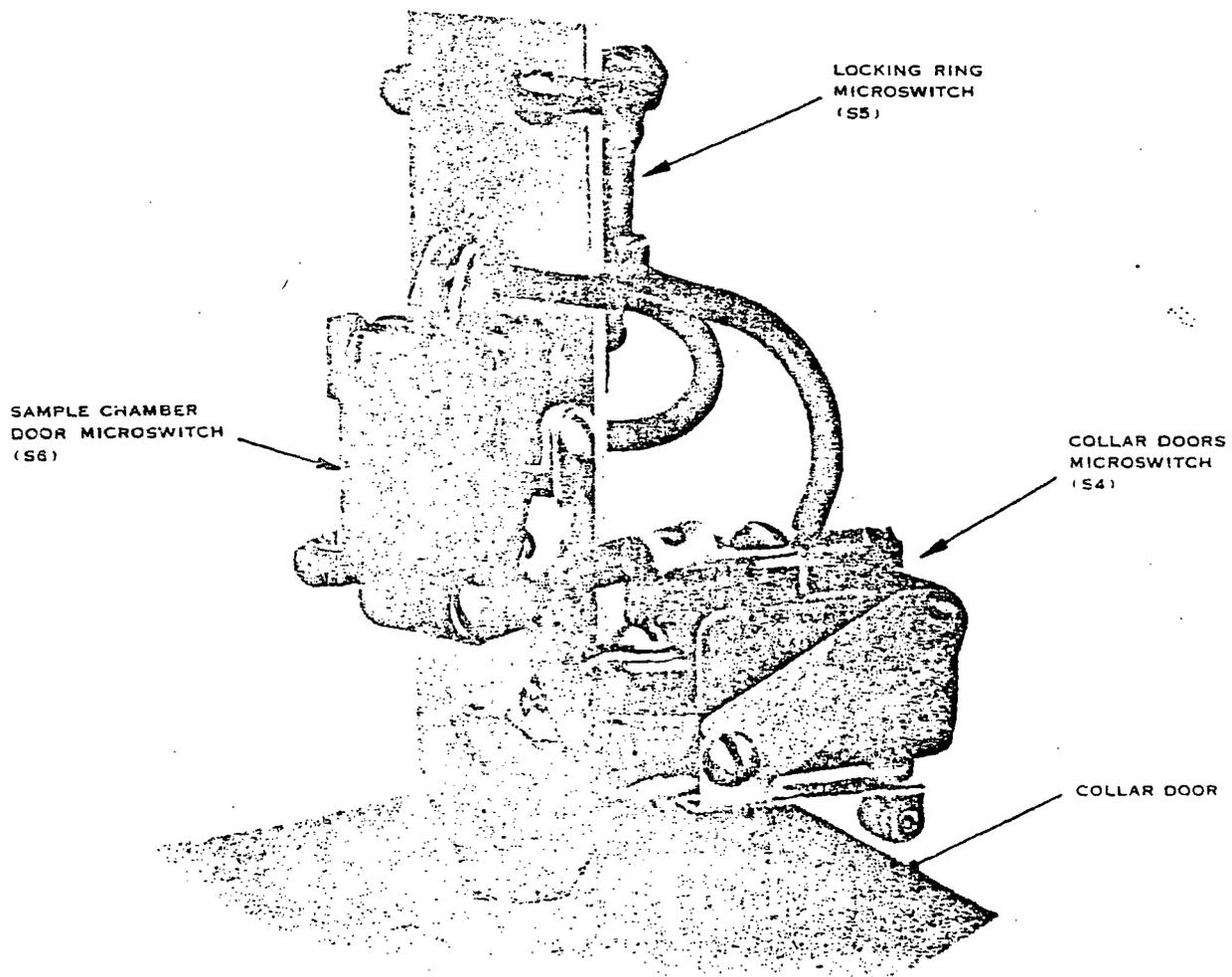
- S5 - mounted adjacent to S4, the switch lever drops into a slot in the locking ring when the ring is properly closed.
- S6 - mounted adjacent to S4 and S5, the switch is actuated by the sample chamber door.
- S7 - mounted on an adjustable bracket on the right side head sprocket, the switch is cam operated to remove the supply to the motor before the end of drawer downward movement. If the drawer fails to reach the irradiating position the mounting bracket should be moved counterclockwise to suit.
- S8 - mounted on a bracket adjacent to S11, the switch is cam operated to remove the supply to the motor toward the limit of the drawer upward movement. The switch should operate when the T-bar is approximately  $\frac{1}{4}$  inch (1.27 cm) from the upper stop.
- S9 - mounted adjacent to the lower mechanical stop the switch is drawer activated approximately  $\frac{1}{4}$  inch (0.64 cm) before end of travel. The switch starts the digital timer.
- S10 - mounted on the lower mechanical stop bracket adjacent to S9 the switch removes the motor supply in the event of a failure in S7.
- S11 - mounted adjacent to, and connected in series with S8, the switch is provided as a safety feature. Should either S8 or S11 fail the other switch will stop the motor driving the drawer against the upper stop.
- S14 - mounted on the top shielding plug the switch activates on the top surface of the drawer top when the shielding plug is closed.
- S15 - mounted on the right hand side of the unit and actuated by the elevating T-bar as it reaches the up position. This is a double pole microswitch S15A and is wired in series with S8 and S11 and limits the upward travel of the elevating T-bar by cutting the supply of power to the motor. S15B is wired normally open and is actuated by the elevating T-bar in the up position to supply power to the door interlock solenoid.

Switches S4, S5, S6 and S14 must be actuated before the motor will operate.

#### UNIT MOVEMENT

AECL recommends that the unit be put into the proper shipping mode as per our field manual "instructions for the preparation and shipping of a GC 220".

CAUTION: If for any reason the electrical supply is disconnected or changed, the motor rotation of the unit must be rechecked. This is accomplished by removing the V-belt and pressing the up button. The motor should rotate in a clockwise direction. If the rotation is counter clockwise, interchange two of the electrical leads.



COLLAR MICROSWITCH ASSEMBLY

FIGURE 9

PART 4

COMPONENT LOCATION

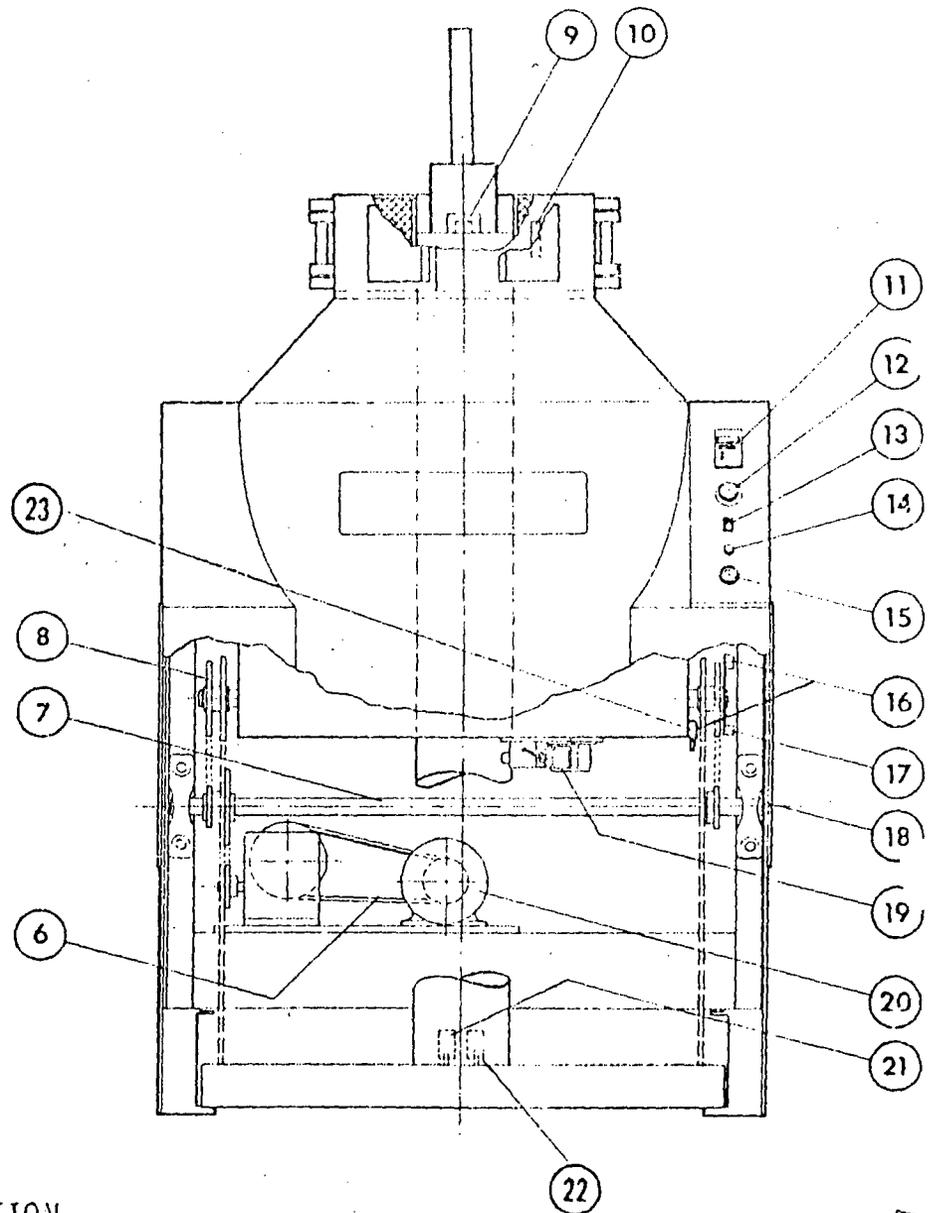
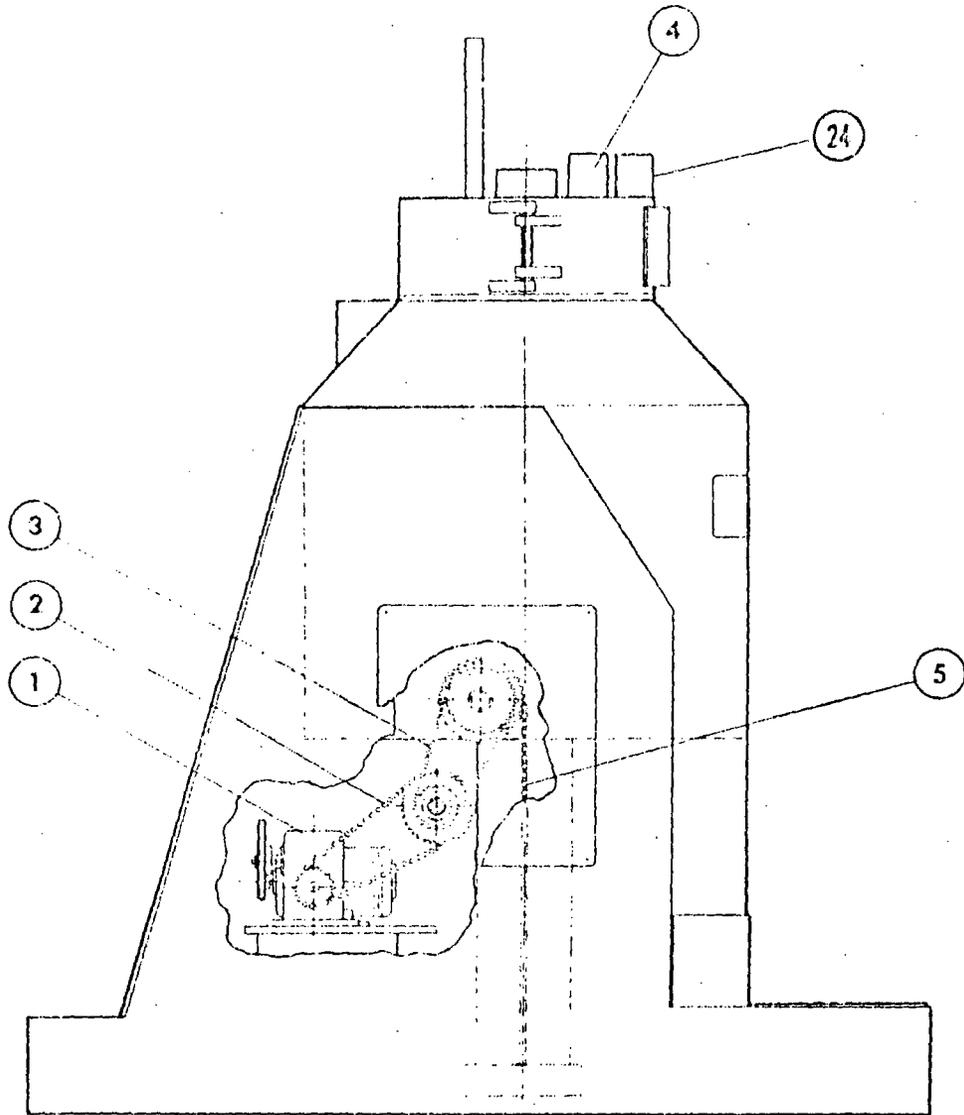
PART 4

COMPONENT LOCATION

## CONTAMINATION DETECTION

## EXCERPT FROM TYPICAL LICENSE FOR BYPRODUCT MATERIALS

- A. Each sealed source containing byproduct material shall be tested for leakage and/or contamination at intervals not to exceed six months. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, the sealed source shall not be used until tested.
- B. The tests shall be capable of detecting the presence of 0.05 microcuries of contamination on the test sample. The test sample shall be taken from appropriate accessible surfaces of the device in which the sealed source is permanently or semi-permanently mounted or stored. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Pertinent Licensing Authority.
- C. If the test reveals the presence of 0.05 microcuries or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Commission regulations. A report shall be filed within five days of the test results, and the corrective action taken. A copy of



COMPONENT LOCATION  
FIGURE 10

## CONTAMINATION DETECTION

## EXCERPT FROM U.S.N.R.C. LICENSE FOR BYPRODUCT MATERIALS

- A. Each sealed source containing byproduct material shall be tested for leakage and/or contamination at intervals not to exceed six months. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, the sealed source shall not be used until tested.
- B. The tests shall be capable of detecting the presence of 0.05 microcurie of contamination on the test sample. The test sample shall be taken from appropriate accessible surfaces of the device in which the sealed source is permanently or semipermanently mounted or stored. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission.
- C. If the test reveals the presence of 0.05 microcurie or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Commission regulations. A report shall be filed within five days of the test with the Director, Division of Materials Licensing, U.S. Nuclear Regulatory Commission, Washington, D.C., 20555, describing the equipment involved, the test results, and the corrective action taken. A copy of such report shall also be sent to the Director of the appropriate U.S. Nuclear Regulatory Commission, Regional Compliance Office listed in Appendix D of 10 C.F.R. 20.  

(A list of addresses is enclosed).
- D. Tests for leakage and/or contamination shall be performed by persons named in Condition 12 of the license or by persons specifically authorized by the Commission to perform such services.

In countries other than the United States of America, the licensee should adhere to the regulations and conditions dictated by the local Atomic Energy Control Authority.

## REMOVABLE CONTAMINATION TEST FOR A.E.C.L. EQUIPMENT CONTAINING COBALT 60 SOURCES

### Wipe Test

The appropriate accessible surfaces of the device (\*) in which the Cobalt 60 sources are permanently mounted shall be wiped thoroughly with a piece of filter paper of high wet strength and absorption capacity, which has been slightly moistened with water. The paper is allowed to dry and the radioactivity on the paper is then measured with an appropriate detector. If the measurement indicates the total activity removed to be less than 0.0005 microcurie the result is described as negative, i.e. no removable contamination is detected.

\*Or "source capsule".

*The above wipe test procedure is conducted by A.E.C.L. prior to shipment of the unit.*

### ROUTINE WIPE CONTAMINATION TEST

#### Method

1. To ensure that there is no loose contamination, two wipe tests will be taken on the machine using 3 inch filter paper of high wet strength moistened with water.
  - (a) With the drawer in the load position, wipe the exposed outside surface of the irradiation chamber.
  - (b) With the drawer in the irradiate position, wipe all the exposed lower surface of the drawer for a distance of 12 inches (30.5 cm) immediately below the bottom shielding.
2. Allow the paper to dry.
3. Count the wipes by placing in contact with a geiger counter operating in a background of no more than 100 counts per minute.
4. If the count recorded is equivalent to more than 0.005 microcuries of removable contamination report by mail to:

Atomic Energy of Canada Limited  
P.O. Box 6300, Station J  
OTTAWA, Ontario K2A 3W3

If the count recorded is equivalent to more than 0.05 microcuries of removable contamination, suspend operation and advise the appropriate licensing body and A.E.C.L. refer Section C of "Excerpt from U.S.N.R.C. License for Cobalt 60".

5. The frequency of the above routine will be governed by the appropriate State or Federal Government Agency, but in any case it is recommended that it be carried out at least once every six months.

TABLE I

USNRC REGIONAL OFFICES

HEAD OFFICE

Director,  
Office of Inspection and Enforcement,  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

REGIONS	OFFICE ADDRESS	TELEPHONE NO.
Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont	Region I, the USNRC Office of Inspection and Enforcement, 631 Park Avenue, King of Prussia, PA 19406	(215) 337-1150 (215) 337-1150
Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, Panama Canal Zone, Tennessee, Virginia, Virgin Islands, and West Virginia	Region II, USNRC Office of Inspection and Enforcement, 101 Marietta St., N.W. Suite 2900 Atlanta, GA 30323	(404) 221-4503 (404) 221-4503
Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin.	Region III, USNRC Office of Inspection and Enforcement, 799 Roosevelt Road, Glen Ellyn, Ill. 60137	(312) 790-5500 (312) 790-5500
Arkansas, Colorado, Idaho, Kansas, Louisiana, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, Utah, and Wyoming	Region IV, USNRC Office of Inspection and Enforcement, 611 Ryan Plaza Drive Suite 1000 Arlington, Texas 76012	(817) 860-8100 (817) 860-8100
Alaska, Arizona, California, Hawaii, Nevada, Oregon, Washington, and U.S. Territories, and possessions in the Pacific	Region V, USNRC Office of Inspection and Enforcement 1450 Maria Lane, Suite 210 Walnut Creek, CA 94596	(415) 943-3700 (415) 943-3700

Nights and Holidays

TABLE 2

CANADIAN N.H.&W., R.P.B.  
FEDERAL AND PROVINCIAL OFFICES

REGIONS	OFFICE ADDRESS	TELEPHONE NO.
National	Radiation Protection Bureau Brockfield Road Ottawa, K1A 1C1, Ontario.	(613) 998-4614  (24 hours)
Newfoundland	Assistant Deputy Minister of Health Department of Health St. John's, Newfoundland	(709) 722-0711
Prince Edward Island	Division of Cancer Control Department of Health P.O. Box 3000 Charlottetown, P.E.I.	(902) 892-3577
Nova Scotia	Consultation Services Department of Health P.O. Box 488 Halifax, Nova Scotia	(902) 424-7571
New Brunswick	Radiation Protection Officer Department of Health Fredericton, N.B.	(506) 453-2542
Quebec	Division of Industrial Hygiene Ministry of Municipal Affairs and Environment 9310 St. Laurent Boulevard Montreal, P.Q.	(514) 873-3454
Ontario	Senior Consultant, Health Physics Community Health Standards Division Ontario Ministry of Health 15 Overlea Boulevard Toronto, Ontario	(416) 965-8178
Manitoba	Co-Ordinator, Radiation Protection Department of Mines, Research & Environmental Management Box 7, 139 Tuxedo Avenue Winnipeg, Manitoba	(204) 489-4511

REGIONS	OFFICE ADDRESS	TELEPHONE NO.
Manitoba	Radiation Protection Section Physics Department Manitoba Cancer Treatment & Research Foundation 700 Bannatyne Avenue Winnipeg 3, Manitoba	(204) 786-4731
Saskatchewan	Occupational Health Division Department of Labour Regina, Saskatchewan.	(306) 265-4538
Alberta	Industrial Health Services Division Alberta Health & Social Development 10523-100 Avenue Edmonton, Alberta	(403) 427-2691
British Columbia	Occupational Health Division Department of Health Services & Hospital Insurance 828 West Tenth Avenue Vancouver 9, B.C.	(604) 874-2331

HEALTH PHYSICS  
WALTER REED ARMY MEDICAL CENTER  
Washington, D.C. 20012

SOP Number

OPERATING AND SAFETY PROCEDURES FOR  
AECL GAMMACELL 40 IRRADIATOR

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Operating Procedures . . . . .	4
Safety Features . . . . .	5
Safety/Emergency Procedures . . . . .	6
References . . . . .	7

1. GENERAL

a. The Gammacell 40 (GC-40) shall be used (operated) by, or under the direct supervision of individuals designated by the Walter Reed Army Medical Center (WRAMC) Radiation Control Committee, Deputy Commander, WRAMC, Chairman.

b. The authorized Principal User is directly responsible for the control and safe use of this irradiator and will designate individuals to operate the GC-40 as approved by the WRAMC Radiation Control Committee.

c. The GC-40 shall be used for medical research and development in radiation biology and radiation dosimetry.

2. DEFINITIONS

Because the precise meaning given to one or more critical terms frequently determines the interpretation of a statement, the following definitions are given for certain words and phrases as they are used in this document:

a. "Shall" - denotes that the ensuing recommendation is necessary or essential to meet the currently accepted standards of radiation protection.

b. "Should" (is recommended) - indicates advisory recommendations that are to be applied when practicable.

c. "Explosive" - explosives are either solid or liquid, either mixtures or single compounds, and act by explosive chemical reaction, liberating at high speed heat and gas, which causes tremendous pressure.

d. "Flammable" - materials capable of being easily ignited; preferred to "inflammable", because of possible ambiguity of the in prefix.

SOP Number

e. "Individual" and/or "Operator" - a person designated by the authorized Principal User, as approved by the WRAMC Radiation Control Committee, to operate the AECL Gammacell 40 Irradiator.

f. "Emergency" - an unforeseen combination of circumstances (e.g., failure of an interlock or safety device, fire, ruptured or leaking source, etc.) that pose a threat to personnel or property by ionizing radiation.

### 3. RESPONSIBILITIES

#### a. The authorized Principal User:

(1) Ensuring that the GC-40 is operated only by individuals authorized to do so by the WRAMC Radiation Control Committee, and in accordance with the conditions of the WRAMC Radioactive Material authorization.

(2) Instruction of individuals in safe operating procedures in accordance with instructions outlined herein. He shall promulgate rules for working safety, including any restrictions of the operating technique known to be necessary.

(3) Ensuring that these instructions and references contained in para 7 are available at the GC-40 unit at all times.

(4) Promptly reporting any source malfunction, accident, or other unplanned occurrence that could result in an unsafe condition or exposure to personnel to the WRAMC Health Physics Officer (301-427-5107).

(5) Assuring that all personnel operating the unit are monitored by appropriate personnel monitoring devices.

(6) Ensuring that personnel operating the unit have been instructed in the hazards and nature of injuries resulting from overexposure to ionizing radiation (e.g., attendance at appropriate WRAMC personnel training programs - HSWP-QHP Memo No. 2)

#### b. WRAMC Health Physics:

(1) Conducting routine radiation protection surveys and inspections.

(2) Providing technical assistance as required.

(3) Providing calibration and routine maintenance services for radiation detection and measuring instruments.

#### c. Individual Operators:

(1) Operating the unit in accordance with the operation and safety procedures delineated in this SOP.

(2) Recording all pertinent information in the operating log maintained by the authorized Principal User.

SOP Number

(3) Being familiar with the content of these instructions, requirements of the WRAMC authorization, and other regulations as may be prescribed by the authorized Principal User.

(4) Locking the GC-40 unit and the room upon completion of use.

(5) Ensuring that the keys to the unit and the room door are properly secured to prevent unauthorized use.

(6) Reporting all malfunctions, accidents, and any other unplanned occurrence that could result in an unsafe condition or exposure of personnel promptly to the authorized Principal User.

#### 4. OPERATION PROCEDURES

a. Insert key in the keyswitch and turn clockwise to the ON position.

b. Open the sample cavity door by holding in the door lock pushbutton and pulling on the door handle.

c. Remove the sample tray by pushing up from the underside.

d. Place the object to be irradiated in the sample tray and cover with the lid.

e. Replace the sample tray in the sample cavity ring.

f. "Chamber Air" - if ventilation to the sample cavity is required, press the "Chamber Air" button on the control panel which will illuminate white when ventilation air supply is on.

g. Close the sample cavity door and lock making sure it latches.

h. If automatic operation is desired:

(1) Press the Manual/Auto selector switch until the Auto portion of the switch is illuminated.

(2) Set the desired time interval on the timer counter. This is achieved by holding in the red reset button located at the left of the digit windows, and depressing the timer selector buttons until the desired numerals appear. Release the red button.

(3) Press the "Source on" pushbutton, both sources will move to the irradiate position and the timer will start. At the end of the preset time the source drawers will automatically move to their fully shielded safe storage position.

1. If manual operation is desired press the Manual/Auto selector switch until the manual portion of the switch is illuminated, then press the "Source On" pushbutton. The sources will remain in the irradiate position until the "Source Off" switch is operated.

SOP Number

## 5. SAFETY FEATURES

Several safety features have been incorporated into the unit for the protection of operating personnel:

a. The source drawers are mechanically interlocked with the sample cavity door to ensure that:

(1) The sample cavity door cannot be opened when the source drawers are in the irradiate position.

(2) The source drawers cannot move into the irradiate position when the sample cavity door is open, or is not completely closed.

b. The mechanical lock on the sample cavity door is electrically interlocked to prevent the door from being opened when either source is not in its fully shielded safe storage position.

c. In the event of a power failure occurring during an irradiation, the source drawers will automatically return to the safe position. After power is restored, the "Source On" pushbutton must be pressed to continue the irradiation.

d. A pressure sensing switch is incorporated in the pneumatic system which will cause the source drawers to return to the safe position if the air pressure drops below 40 psig. Should this situation occur, the Low Air Indicator lamp on the control panel will be illuminated.

## 6. SAFETY/EMERGENCY PROCEDURES

a. The GC-40 shall be operated as described in the Atomic Energy of Canada Limited "Instruction Manual Gammacell 40 Caesium 137 Irradiation Unit," edition No. 3, September 1977, and in accordance with this Standing Operating Procedure.

b. Emergency Procedures: See Annex A of this Standing Operating Procedure.

c. No individual shall undertake repair, perform any maintenance, remove any interlock and/or safety device, or make any changes in and/or on the GC-40 without prior approval of the authorized Principal User and the Health Physics Officer, WRAMC.

d. Under NO circumstances shall explosive material be irradiated in the GC-40.

e. All operators and/or assistants shall wear personnel monitoring devices while working around and/or operating the GC-40 irradiator.

f. Health Physics, WRAMC, will perform leak tests, periodic inspections and radiation protection surveys.

HSHL-HP  
SOP Number

g. An operating log shall be maintained by the authorized Principal User.

h. Key Control:

(1) Operating keys will be held under direct supervision of the authorized Principal User approved by the WRAMC Radiation Control Committee. The Principal User is responsible for assuring proper key control and key security.

(2) Duplicate keys for the GC-220 and GC-40 will be secured by the authorized Principal User.

7. REFERENCES

a. Atomic Energy of Canada Limited "Instruction Manual Gammacell 40 Cesium 137 Irradiation Unit," edition No. 3, September 1977.

b. Nuclear Regulatory Commission By-Product Material License No. 08-01738-03.

1 Incl  
ANNEX A - Emergency Procedures  
for AECL Gammacell  
40 Irradiator

ANNEX A to Health Physics SOP Number

EMERGENCY PROCEDURES  
FOR  
AECL GAMMACELL 40 IRRADIATOR

1. In the event of an emergency, malfunction, or other unusual occurrence, the following individuals shall be notified after pressing the "Source Off" switch:

- a. Authorized Principal User, USAMRIID, Extension 7241.
- b. Health Physics Officer, WRAMC, Phone 301-427-5107.
- c. Safety Officer, USAMRIID, Extension 7373.
- d. Staff Duty NCO, USAMRIID (after duty hours), Extension 7335.

The senior individual at the site shall clear the area of personnel and restrict access to the area until relieved by competent authority.

2. In the event of fire the following individuals shall be notified:

- a. Fire Department, Fort Detrick, Extension 7333.
- b. Authorized Principal User, USAMRIID, Extension 7241.
- c. Health Physics Officer, WRAMC, Phone 301-427-5107.
- d. Safety Officer, USAMRIID, Extension 7373.
- e. Staff Duty NCO, USAMRIID (after duty hours), Extension 7335.

The senior individual at the site shall clear the area of personnel and restrict access to the area until relieved by competent authority. Fire fighters may enter the area after the radiation hazard has been determined. There is little likelihood of radiation hazard unless the temperature of the source shield reaches the melting point of lead (621°F). Water should be sprayed on the source shield if there is any possibility of the temperature approaching this value.

3. Following an emergency the GC-40 shall not be operated until an inspection and a radiation protection survey have been conducted by WRAMC Health Physics.

ANNEX A to Health Physics SOP Number

EMERGENCY PROCEDURES  
FOR  
AECL GAMMACELL 40 IRRADIATOR

1. In the event of an emergency, malfunction, or other unusual occurrence, the following individuals shall be notified after pressing the "Source Off" switch:

- a. Authorized Principal User, WRAIR, Extension 576-3428.
- b. Radiation Protection Officer, WRAIR, Extension 576-3428.
- c. Health Physics Officer, WRAMC, Extension 301-427-5107.
- d. Staff Duty Officer, WRAMC (after duty hours), Extension 576-3501/2309.

The senior individual at the site shall clear the area of personnel and restrict access to the area until relieved by competent authority.

2. In the event of a fire, the following individuals shall be notified:

- a. Fire Department, WRAMC, Extension 576-3317.
- b. Authorized Principal User, WRAIR, Extension 576-3428.
- c. Radiation Protection Officer, WRAIR, Extension 576-3428.
- d. Health Physics Officer, WRAMC, Extension 301-427-5107.
- e. Staff Duty Officer, WRAMC (after duty hours), Extension 576-3501/2309.

The senior individual at the site shall clear the area of personnel and restrict access to the area until relieved by competent authority. Fire fighters may enter the area after the radiation hazard has been determined. There is little likelihood of radiation hazard unless the temperature of the source shield reaches the melting point of lead (621°F). Water should be sprayed on the source shield if there is an possibility of the temperature approaching this value.

3. Following an emergency the GC-40 shall not be operated until an inspection and a radiation protection survey have been conducted by WRAMC Health Physics

INSTRUCTION MANUAL

GAMMACELL 40  
CAESIUM 137 IRRADIATION UNIT

EDITION NO. 3, SEPTEMBER 1977



ATOMIC ENERGY OF CANADA LIMITED  
COMMERCIAL PRODUCTS  
OTTAWA, CANADA

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PART 1  
DESCRIPTION

GENERAL

The Gammacell 40 is a Caesium 137 irradiation unit manufactured by Atomic Energy of Canada Limited and is designed for use in an unshielded room. The unit provides a means for uniform gamma irradiation of small animals or biological samples while providing complete protection for operating personnel. Figure 1 illustrates the general features and dimensions of the unit.

A Caesium 137 double encapsulated source is housed in each of two cylindrical sliding drawers, one above and one below the sample cavity. The source drawers are moved from the shielded position to the irradiate position by pneumatic cylinders.

The sample cavity consists of an aluminum ring 13.0 in (33.02 cm) inside diameter x 4.875 in (12.38 cm) deep. The cavity is open at the top and bottom and has hanger slots in the top rim from which to suspend the sample tray. The ring is secured to a hinged door such that when opened, the sample tray swings out with the door and is easily accessible without reaching into the irradiation cavity.

A plastic sample tray with lid and supports for use in the sample cavity is provided with the unit. The internal

dimensions of the tray are 12 in (30.5 cm) diameter by 4.13 in (10.5 cm) deep. The sample tray has ventilation holes in its side which align with ventilation ports through the main shield.

Three stainless steel access tubes 0.375 in (0.95 cm) inside diameter are provided which lead into the sample cavity. Two of these tubes pass through the sample cavity door and can be used for instrumentation. The remaining tube passes through the fixed shield and is used for cavity ventilation.

The sourcehead pneumatic cylinders and controls are entirely covered by a removable sheet metal enclosure consisting of upper and lower enclosures with inspection covers and two end panels. The upper enclosure contains the control panel.

## ELECTRICAL POWER REQUIREMENTS

### a) Standard Unit

The standard unit requires a power supply of 110/120 VAC, 60 Hz, single phase, 2 kVa. Fusing and wiring must be adequate for a 1/2 HP motor load. The circuit used to power the unit must have sufficient capacity to prevent release of relays in the unit caused by voltage drop when the compressor motor starts. An ON/OFF circuit switch in the immediate vicinity of the unit is recommended.

### b) Optional Power Supply

Some units are supplied to operate on 220/230 VAC, 50 Hz, single phase power supply.

### c) Power Cable

Where local electrical codes permit, the unit may be plugged into a suitable wall receptacle. A 10 ft (3 m) power cable with a three-prong plug is provided for this purpose.

### AIR COMPRESSOR

An air compressor, complete with reservoir tank, provides air for both drawer movement and sample cavity ventilation. The compressor is driven by a 1/2 HP motor.

The air is filtered, regulated and lubricated at a panel mounted under the sheet metal on the right hand side of the unit. Plastic tubing provides connection to the cavity access tube through which filtered, unlubricated, controlled air is bled into the sample cavity for ventilation purposes. The manual air valve has been adjusted to allow for a slow flow of air into the cavity. A solenoid valve operated by a switch on the control panel will switch the air on or off. The manual air valve should not need re-adjusting, however if adjusted, keep the ventilation air supply well below that of the air compressor as a drop in pressure will impede the operation of the source drawers.

### SEALED SOURCES

The doubly encapsulated Caesium 137 source capsules, (C-161, Type 8) are mounted in brass encased lead filled horizontal cylinders, 2.5 in (6.35 cm) diameter and 16.0 in (40.64 cm) long and are held in place by Truarc retaining rings (one to each capsule).

## SAMPLE CAVITY DOOR

The sample cavity door is a steel encased, lead filled segment of the cylindrical shield which is attached by hinges to the fixed shielding. The sample cavity ring is mounted on the inner curved surface of the sample cavity door. The sample cavity door has a mechanical lock which is electrically interlocked when either source is not in its safe storage position.

## CONTROL PANEL

The control panel is secured to the upper sheet metal cover with four machine screws. The electrical wiring plugs into the back of the panel.

(Refer to Figure 1) Reading from left to right, top row first, the controls are:

1. Keyswitch - to control the electrical supply to the unit.
2. "Manual/Auto" Mode Switch - a split window, alternate action, illuminating pushbutton switch. The lower half illuminates blue (Automatic); the upper half illuminates white (Manual).
3. "Timer" Assembly - a digital timer of the manual reset type which will accommodate a timed operation of up to 9999.9 minutes duration. A pushbutton switch is provided immediately below each digit window to control setting adjustments. A timer reset pushbutton is located on the left side of the windows. Momentary actuation of the reset pushbutton will reset the timer for repeat irradiations.

4. "Source On" Switch - an illuminated pushbutton switch to control the movement of the source drawers to the "irradiate" position. The screen illuminates red to indicate that both source drawers have moved from the safe position.
5. "Source Off" Switch - an illuminated pushbutton switch to control the movement of the source drawers to the safe position. The screen illuminates green in two halves to indicate that both source drawers have moved from the irradiate position.

*NOTE: Both the "Source On" and "Source Off" lamps are illuminated during the period that the source drawers are travelling. Only the red or green pushbuttons remain illuminated when the drawers complete their travel and these screens indicate the position of the source. The drawers do not necessarily travel in unison, one may complete its travel before the other one moves.*

6. "Low Air/Timer On" Indicator Lamp - a split window press-to-test type indicator. The lower half illuminates red to indicate a low pressure condition. In this event the source drawers will automatically return to the safe position. The upper half illuminates blue to indicate that the timer is running.
7. "Chamber Air" Switch - an alternate action illuminating pushbutton switch. The screen indicates white when air is being used for sample cavity ventilation purposes.

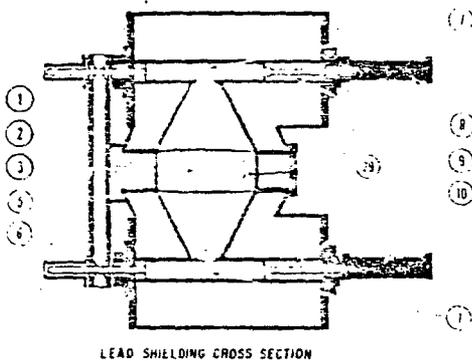
## SAFETY FEATURES

Several safety features have been incorporated into the unit for the protection of operating personnel:

1. The source drawers are mechanically interlocked with the sample cavity door. A square section steel rod is mounted on the front of each source drawer which will only pass through slots in tubular extensions of the sample cavity door hinge pin when the door is closed. This ensures that:
  - a) The sample cavity door can not be opened when the source drawers are in the irradiate position.
  - b) The source drawers can not move into the irradiate position when the sample cavity door is open, or is not completely closed.
2. The mechanical lock on the sample cavity door is electrically interlocked to prevent the door from being opened when either source is not in its fully shielded safe storage position.

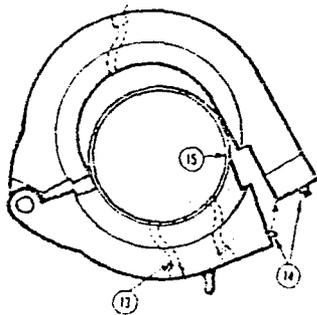
## WEIGHTS

The Gammacell 40 weighs approximately 6300 lb (2858 kg) when assembled in its operating configuration. Crated weight is in the region of 6500 lb (2948 kg).

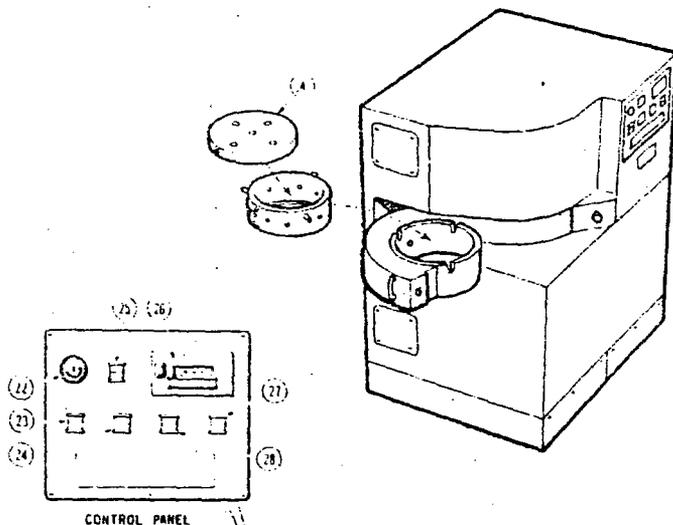


LEAD SHIELDING CROSS SECTION

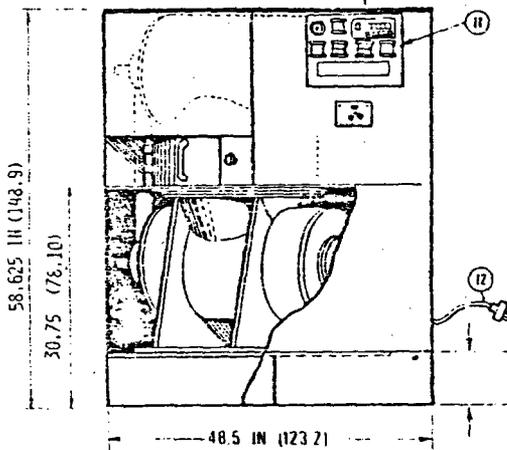
7/8 IN 9 UNC X 1.0 IN (2.54CM)  
TAPPED HOLED (3)



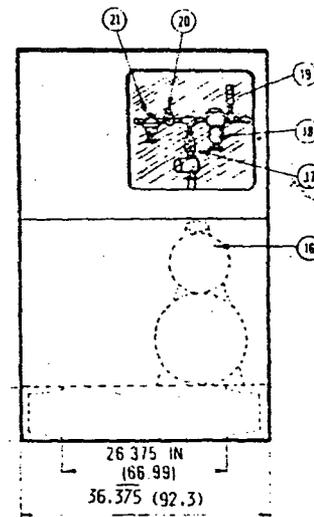
NOTE: DIMENSIONS IN BRACKETS ARE  
CENTIMETERS.



CONTROL PANEL



FRONT



REAR

PARTS LIST

- |  |   |  |
|--|---|--|
| 1 MECHANICAL INTERLOCK (UPPER)                                     | 13 ACCESS/VENTILATION TUBE (3)              | 26 DIGITAL TIMER   |
| 2 ATTENUATOR (UPPER)   | 14 SAMPLE DRAWER LOCK                       | 27 CHAMBER AIR ILLUMINATED PUSHBUTTON  |
| 3 SAMPLE CAVITY<br>15.0 IN (38.1 CM) DIA X 4.87 IN (12.37 CM) DEEP | 15 SAMPLE CHAMBER CAVITY RING               | 28 TIMER ON/OFF AIR INDICATOR LAMP   |
| 4 SAMPLE DRAWER TRAY (CARB. PLASTIC)                               | 16 AIR COMPRESSOR & STORAGE TANK WITH GAUGE | 29 SAMPLE CAVITY COLLIMATOR -<br>REF: AECL PRODUCT NO. 10-059.<br>(OPTIONAL NOT ILLUSTRATED) |
| 5 ATTENUATOR (LOWER)   | 17 PRESET VENTILATING VALVE                 |  |
| 6 MECHANICAL INTERLOCK (LOWER)                                     | 18 FILTER                                   |  |
| 7 SOURCE "ON" POSITION   | 19 PRESSURE SENSING SWITCH                  |  |
| 8 SOURCE DRAWER CYLINDER (UPPER)                                   | 20 AIR PRESSURE REGULATOR AND GAUGE         |  |
| 9 SOURCE "OFF" POSITION  | 21 LUBRICATOR                               |  |
| 10 SOURCE DRAWER CYLINDER (LOWER)                                  | 22 POWER ON/OFF KEY SWITCH                  |  |
| 11 CONTROL PANEL   | 23 SOURCE "ON" PUSHBUTTON SWITCH            |  |
| 12 POWER CABLE (100 FT)  | 24 SOURCE "OFF" PUSHBUTTON SWITCH           |  |
|  | 25 PANEL ZINC STEEL FOR PUSHBUTTON SWITCH   |  |

ATOMIC ENERGY OF CANADA LIMITED  
COMMERCIAL PRODUCTS

P.O. BOX 6500 Postal Station C OTTAWA, CANADA.

TITLE  
GAMMACELL 40  
GENERAL DIMENSION LAYOUT

REF DWG

REVISED MAY 1976

THIS DRAWING IS THE PROPERTY OF ATOMIC ENERGY OF CANADA LIMITED AND IS SUBMITTED FOR CONSIDERATION ON THE UNDERSTANDING THAT THERE SHALL BE NO EXPLOITATION OF ANY INFORMATION CONTAINED HEREIN EXCEPT WITH THE SPECIFIC WRITTEN AGREEMENT OF ATOMIC ENERGY OF CANADA LIMITED.

DATE

No.

REV.

DRAWN

CHECKED

APPROVED

J1000-X-1

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3/5

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3/26/76

SHEET 1 OF 1

PART 2  
OPERATION

AUTOMATIC OPERATION

1. Insert key in the keyswitch and turn clockwise to the ON position.
2. Open the sample cavity door by holding in the door lock pushbutton and pulling on the door handle.
3. Remove the sample tray by pushing up from the underside.
4. Place the object to be irradiated in the sample tray and cover with the lid.
5. Replace the sample tray in the sample cavity ring.
6. "Chamber Air" - if ventilation to the sample cavity is required, press the "Chamber Air" button on the control panel which will illuminate white when ventilation air supply is on.
7. Close the sample cavity door and lock making sure it latches.
8. Press the Manual/Auto selector switch until the Auto portion of the switch is illuminated.
9. Set the desired time interval on the timer counter. This is achieved by holding in the red reset button located at the left of the digit windows, and depressing the timer selector buttons until the desired numerals appear. Release the red button.
10. Press the "Source On" pushbutton, both sources will move to the irradiate position and the timer will start. At

the end of the preset time the source drawers will automatically move to their fully shielded safe storage position.

*NOTE: If it is required to open the sample cavity door during a timed irradiation, the sources must be returned to their safe positions. The timer will store the remaining portion of the preset time until the operation is resumed.*

#### MANUAL OPERATION

1. For the initial steps refer to Automatic Operation, steps 1 to 7 inclusive.
2. Press the Manual/Auto selector switch until the manual portion of the switch is illuminated.
3. Press the "Source On" pushbutton. The sources will remain in the irradiate position until the "Source Off" switch is operated.

#### POWER FAILURE

In the event of a power failure occurring during an irradiation, the source drawers will automatically return to the safe position. After power is restored the "Source On" pushbutton must be pressed to continue the irradiation.

#### AIR PRESSURE FAILURE

A pressure sensing switch is incorporated in the pneumatic system which will cause the source drawers to return

to the safe position if the air pressure drops below 40 psig.  
Should this situation occur, the Low Air indicator lamp on  
the control panel will be illuminated.

PART 3  
MAINTENANCE AND SERVICE

ELECTRICAL DRAWINGS

A set of pertinent electrical drawings is supplied with each unit to enable the customer to correct minor electrical problems.

SLIDING SOURCE DRAWERS

In the unlikely event that either source drawer should malfunction, no remedial action shall be taken by the responsible user of the equipment. Since the sealed source(s) is inherently shielded during all modes of operation, no personnel hazard is possible.

If such malfunction occurs, operations should be suspended and the Installation and Services Department of AECL should be notified immediately as to the nature of the incident. AECL, or their Agent, will assess the situation and take what action they deem necessary to remedy the fault and re-commission the unit.

Such services as are rendered in this regard may incur additional charges to the customer in accordance with the terms of the contract to purchase and/or warranty.

GENERAL

The following equipment inspection and maintenance procedures are those considered to be the minimum necessary

for continuing efficient operation of the unit. Frequency of application will be governed by individual requirements and users experience.

inspection covers in the sheet metal are provided at each source drawer mechanical interlock position (2) and the pneumatic control panel.

The upper and lower sheet metal covers and two back panels are also removable, providing access to the internal components. It is advisable to disconnect the power supply before removing the main sheet metal. It is necessary to remove the control panel before removing the upper sheet metal cover. The control panel is secured by four machine screws. When the four machine screws are removed the electrical wiring can be unplugged from the back of the panel. The right hand side panels and skirt covers must be taken off before the upper and lower main covers can be removed.

### WEEKLY

#### PNEUMATIC SYSTEM

1. Check for air and oil leaks.
2. Drain residue from the air filter by opening the drain valve on the filter bowl.
3. Check the oil level in the air line lubricator. If necessary refill with SAE 10 regular motor oil (non-detergent).

6 MONTHLY

Drain water from the compressor reservoir tank by opening the drain valve located on the underside of the tank. The compressor is located under the sheet metal covers at the back right hand side and access can be obtained by removing the lower side panel.

In humid locations, it may be necessary to drain more frequently.

## CONTAMINATION DETECTION

## EXCERPT FROM TYPICAL LICENSE FOR BYPRODUCT MATERIALS

- A. *Each sealed source containing byproduct material shall be tested for leakage and/or contamination at intervals not to exceed six months. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, the sealed source shall not be used until tested.*
- B. *The tests shall be capable of detecting the presence of 0.05 microcuries of contamination on the test sample. The test sample shall be taken from appropriate accessible surfaces of the device in which the sealed source is permanently or semi-permanently mounted or stored. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Pertinent Licensing Authority.*
- C. *If the test reveals the presence of 0.05 microcuries or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Commission regulations. A report shall be filed within five days of the test results, and the corrective action taken. A copy of*

*such report shall also be sent to the Director of the appropriate Regional Compliance Office listed in this Part of the Instruction Manual.*

#### NOTE ON MEASUREMENT

1. Tests for leakage and/or contamination shall be performed by persons named in the Conditions of the license or by persons specifically authorized by the Pertinent Licensing Authority to perform such services.
2. Tests should be made with equipment comparable to the BERTHOLD RATO/F Survey Meter as used by the Installation and Services Department of AECL.

The BERTHOLD RATO/F Meter has been calibrated against an AECL standard  $^{137}\text{Cs}$  source. Using the 3 inch filter paper(s) recommended for wipe testing  $^{137}\text{Cs}$  sources, a scale reading of 210 counts per minute (cpm) above background is equal to 0.05 microcuries of contamination (see Excerpt B).

3. The licensee should adhere to the regulations and conditions dictated by the local Atomic Energy Control Authority.

#### REMOVABLE CONTAMINATION TEST FOR AECL EQUIPMENT CONTAINING CAESIUM 137 SOURCES

##### Wipe Test

The appropriate accessible surfaces of the device (\*) in which the sources are permanently or semi-permanently

Or "source capsule".

mounted shall be wiped thoroughly with a piece of filter paper of high wet strength and absorption capacity, which has been slightly moistened with water. The paper is allowed to dry and the radioactivity on the paper is then measured with an appropriate detector. If the measurement indicates the total activity removed to be less than 0.005 microcuries the result is described as negative, i. e. no removable contamination is detected.

#### NOTE ON MEASUREMENT

Tests are made with equipment comparable to the BERTHOLD RATIO/F Survey Meter (as used by the Service Department of AECL) which has been calibrated to AECL standards. (See Note 2, Excerpt from Typical License for Byproduct Materials.)

*The above wipe test procedure is conducted by AECL prior to shipment of the unit.*

#### ROUTINE WIPE CONTAMINATION TEST

##### METHOD:

1. Open sample cavity door.
2. Using 3 inch filter paper of high wet strength and absorption capacity moistened with water, perform a wipe test on the accessible portion of the perimeter of the upper attenuator (see Figure 11).
3. Allow the wipe samples to dry.
4. Remove the upper and lower inspection covers on the left hand side of the sheet metal enclosure.

5. Using more filter papers moistened with water, perform wipe tests around the source drawer mechanical interlocks for both the upper and lower sources. (See Figure 1).
6. Allow wipe samples to dry.
7. Count all wipe samples by placing in contact with a survey meter operating in a background field of not more than 0.25 mrv.

#### NOTE ON MEASUREMENT

Tests should be made with equipment comparable to the BERTHOLD RATO/F Survey Meter as used by the Installation and Services Department of AECL.

The BERTHOLD RATO/F Meter has been calibrated against an AECL standard  $^{137}\text{Cs}$  source. Using the 3 inch filter paper(s) recommended for wipe testing  $^{137}\text{Cs}$  sources, a scale reading of 210 counts per minute (cpm) above background is equal to 0.05 microcuries of contamination (see Excerpt B).

8. If the count recorded exceeds 100 cpm, report to:  
Atomic Energy of Canada Limited, Commercial Products,  
P. O. Box 6300, Postal Station "J",  
OTTAWA, Ontario, Canada. K2A 3W3
9. If the count recorded exceeds 210 cpm (0.05 microcuries of removable contamination) suspend operations and advise the Appropriate Licensing Authority and AECL.
10. Replace all sheet metal enclosures.

11. The frequency of the above routine will be governed by the appropriate Agreement State or Federal Government Agency, but in any case it is recommended that it be carried out at least once every six months.

TABLE I

USAEC REGIONAL OFFICES

HEAD OFFICE

Director,  
Division of Materials Licensing  
U.S. Atomic Energy Commission,  
Washington, D.C. 20545

REGIONS	OFFICE ADDRESS	TELEPHONE NO.
Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont	Region I, the USNRC Office of Inspection and Enforcement, 631 Park Avenue, King of Prussia, PA 19406	(215) 337-1150 (215) 337-1150
Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, Panama Canal Zone, Tennessee, Virginia, Virgin Islands, and West Virginia	Region II, USNRC Office of Inspection and Enforcement, 101 Marietta St., N.W. Suite 2900 Atlanta, GA 30323	(404) 221-4503 (404) 221-4503
Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin.	Region III, USNRC Office of Inspection and Enforcement, 799 Roosevelt Road, Glen Ellyn, Ill. 60137	(312) 790-5500 (312) 790-5500
Arkansas, Colorado, Idaho, Kansas, Louisiana, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, Utah, and Wyoming	Region IV, USNRC Office of Inspection and Enforcement, 611 Ryan Plaza Drive Suite 1000 Arlington, Texas 76012	(817) 860-8100 (817) 860-8100
Alaska, Arizona, California, Hawaii, Nevada, Oregon, Washington, and U.S. Territories, and possessions in the Pacific	Region V, USNRC Office of Inspection and Enforcement 1450 Maria Lane, Suite 210 Walnut Creek, CA 94596	(415) 943-3700 (415) 943-3700

\*Nights and Holidays

TABLE 2

CANADIAN N. H. AND W., R. P. B.  
FEDERAL AND PROVINCIAL OFFICES

REGIONS	OFFICE ADDRESS	TELEPHONE NO.
National	Inter-Agency Committee on Radiation Accidents, Brookfield Road, Ottawa 8, Ontario	(613) 998-4614  (24 hours)
Newfoundland	Assistant Deputy Minister of Health, Department of Health, St. John's, Newfoundland	(709) 722-0711
Prince Edward Island	Division of Cancer Control, Department of Health, P. O. Box 3000, Charlottetown, P. E. I.	(902) 892-3577
Nova Scotia	Consultation Services, Department of Health, P. O. Box 488, Halifax, Nova Scotia	(902) 424-4425
New Brunswick	Radiation Protection Officer, Department of Health, Fredericton, N. B.	(506) 453-2067
Quebec	Division of Industrial Hygiene, Ministry of Municipal Affairs and Environment, 9310 St. Laurent Boulevard, Montreal, P. Q.	(514) 873-3454
Ontario	Senior Consultant, Health Physics, Community Health Standards Division, Ontario Ministry of Health, 15 Overlea Boulevard, Toronto, Ontario	(416) 965-8178
Manitoba	Co-Ordinator, Radiation Protection, Department of Mines, Research and Environmental Management, Box 7, 139 Tuxedo Avenue, Winnipeg, Manitoba	(204) 489-4511

TABLE 2

CANADIAN N. H. AND W., R. P. B.  
FEDERAL AND PROVINCIAL OFFICES

REGIONS	OFFICE ADDRESS	TELEPHONE NO.
National	Inter-Agency Committee on Radiation Accidents, Brookfield Road, Ottawa 8, Ontario	(613) 998-4614  (24 hours)
Newfoundland	Assistant Deputy Minister of Health, Department of Health, St. John's, Newfoundland	(709) 722-0711
Prince Edward Island	Division of Cancer Control, Department of Health, P. O. Box 3000, Charlottetown, P. E. I.	(902) 892-3577
Nova Scotia	Consultation Services, Department of Health, P. O. Box 488, Halifax, Nova Scotia	(902) 424-4425
New Brunswick	Radiation Protection Officer, Department of Health, Fredericton, N. B.	(506) 453-2067
Quebec	Division of Industrial Hygiene, Ministry of Municipal Affairs and Environment, 9310 St. Laurent Boulevard, Montreal, P. Q.	(514) 873-3454
Ontario	Senior Consultant, Health Physics, Community Health Standards Division, Ontario Ministry of Health, 15 Overlea Boulevard, Toronto, Ontario	(416) 965-8178
Manitoba	Co-Ordinator, Radiation Protection, Department of Mines, Research and Environmental Management, Box 7, 159 Tuxedo Avenue, Winnipeg, Manitoba	(204) 489-4511

REGIONS	OFFICE ADDRESS	TELEPHONE NO.
Manitoba	Radiation Protection Section, Physics Department, Manitoba Cancer Treatment and Research Foundation, 700 Bannatyne Avenue, Winnipeg 3, Manitoba	(204) 786-4731
Saskatchewan	Occupational Health Division, Department of Public Health, Provincial Health Building, Regina, Saskatchewan	(306) 527-8543
Alberta	Industrial Health Services Division, Alberta Health and Social Development, 10523-100 Avenue, Edmonton, Alberta	(403) 429-1491
British Columbia	Occupational Health Division, Department of Health Services and Hospital Insurance, 828 West Tenth Avenue, Vancouver 9, B. C.	(604) 874-2331

HEALTH PHYSICS  
WALTER REED ARMY MEDICAL CENTER  
Washington, D.C. 20012

HSWP-QHP  
\*SOP Number 1-6

26 March 1982

LEAK TESTING AND INVENTORY OF SEALED SOURCES

1. PURPOSE. The purpose of this SOP is to provide continuity in the standard leak testing procedures for sealed sources containing alpha, beta and/or gamma emitting radionuclides possessed, used and stored at WRAMC and tenant activities.

2. GENERAL.

a. Despite the fact that many precautions are taken to prevent leakage, the radioactive materials do occasionally leak from the capsule. Radioactive material which leaks from a source is a hazard in that it may become airborne or transported in some other way to become inhaled or ingested by personnel. The purpose of leak-testing sealed sources is to detect the leakage of the radionuclide before it becomes a hazard, and to comply with applicable regulations.

b. All sources at WRAMC will be leak-tested by the Health Physics Office Operations Branch.

c. Where a conflict of regulations (to include applicable USNRC Licenses and DA Authorizations) exists, the more restrictive regulation will be followed.

d. Sealed Source means any radioactive material that is inclosed in, or is to be used in, a container in a manner intended to prevent leakage of the radioactive material or any of its daughter products.

e. Leak Test Requirements:

(1) Each sealed source acquired by WRAMC and containing radioactive material, other than Hydrogen 3, with a half-life greater than thirty days and in any form other than gas shall be tested for contamination and/or leakage prior to use. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, the sealed source shall not be put into use until tested.

(2) Any licensed sealed source is exempt from such leak tests when the source contains 100 microcuries or less of beta and/or gamma emitting material or 10 microcuries or less of alpha emitting material.

(3) Except for alpha sources, the periodic leak test requirement specified below does not apply to sealed sources that are stored and not being used. The sources excepted from this test shall be tested for leakage prior to any use or transfer to another person unless they have been leak tested within six months prior to the date of use or transfer.

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\* This SOP supersedes HP SOP 1-6, dated 16 July 1980

SOP REVIEWED - NO CHANGES NEEDED - 28 JULY 1983

SOP REVIEWED - NO CHANGES NEEDED - 15 FEBRUARY 1985

Incl 4 to Supl 2, Form NRC 313(I), Item 15

26 March 1982

(4) Each sealed source containing by-product material, other than Hydrogen 3, with a half-life greater than thirty days and in any form other than gas shall be tested for leakage and/or contamination at intervals not to exceed six months except that each source designed for the purpose of emitting alpha particles shall be tested at intervals not to exceed three months.

(5) The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. The test sample shall be taken from the sealed source or from the surfaces of the device in which the sealed source is permanently or semipermanently mounted or stored on which one might expect contamination to accumulate. Records of leak test results shall be kept in units of microcuries and maintained by the Health Physics Office.

f. If there is reason to suspect that a sealed source might have been damaged, it will be tested for leakage before further use.

g. All sealed sources found to be leaking and/or contaminated will be immediately withdrawn from use by Health Physics. The Health Physics Officer will determine whether or not the source is leaking. If it is leaking, he will direct that it be resealed or disposed of in accordance with existing regulations.

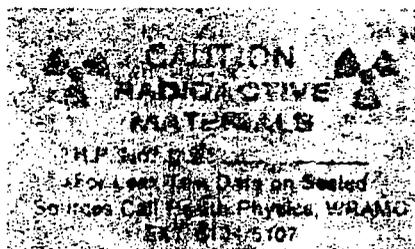
h. Inventory Requirements:

(1) Each sealed source at WRAMC containing quantities of radioactive material in excess of 0.1 microcuries of radionuclide requiring a DA Authorization, or quantities of by-product material in excess of the quantities listed in 10 CFR 30.71, Schedule B, shall be inventoried quarterly as required by 10 CFR 35.14.

(2) The leak testing procedure specified in paragraph 2e of this SOP shall constitute the required inventory for sources that must be leak tested.

(3) Each sealed source at WRAMC will be assigned a Health Physics Control Number by the Radioactive Materials Control Branch.

(4) Each sealed source or its container will be labeled as shown below with the Health Physics Control Number for that source:



3. SAFETY.

a. Appropriate safety measures will be observed while performing leak tests to minimize personnel exposures. Such measures will maximize the use of time, distance and shielding.

26 March 1982

b. High intensity sources such as brachytherapy sources will not be touched. They will be handled with remote handling devices or longhandled forceps.

c. Appropriate personnel monitoring devices such as whole-body film badges, wrist film badges and self-reading dosimeters will be worn while performing leak tests.

#### 4. LEAK TESTING METHODS.

a. In general, alpha, beta and gamma sealed sources are leak tested by taking a one (1) inch diameter filter paper disc and obtaining a dry or wet wipe of accessible areas of the source or source holder in which the source is permanently mounted. When taking wet wipes the solution used should not be harmful to the source capsule or holder. All exposed surfaces of the source or holder will be wiped. Paper wipes will be placed in paper envelopes or plastic bags and sent for Laboratory analysis. Care will be taken to avoid cross-contamination.

##### b. Radium Sources.

(1) Brachytherapy sources (Charcoal Absorption Test) - Approximately 1/2 gram of activated charcoal is placed in a capped/stoppered glass tube. A wad of cotton is placed over the charcoal to separate charcoal and source. The source will remain in the sealed tube for at least 24 hours. After 24 hours, uncap the tube, remove the source, immediately reseal the tube and send sample to Laboratory for analysis. A blank charcoal control sample will be sent along with each sample to distinguish environmental Radon from that produced by the source.

(2) Other radium sources - Sources too large to be tested by the method outlined in b(1), above, will be tested by using a sealable plastic bag in place of the glass tube. All other procedures will be the same as b(1).

c. Gamma Irradiators (AECL Gammacells) - Dry paper wipes will be obtained from the following locations if they are accessible:

(1) Upper external ram.

(2) Inside the irradiator chamber.

(3) Lower external ram.

(4) Floor beneath the ram.

Leak testing will be performed with the source in the unexposed position.

5. SAMPLE PROCESSING.

a. All samples will be forwarded to the Laboratory for quantitative analysis. Samples will be identified by the Health Physics Control Number of the source tested.

b. Data furnished for samples taken by the Charcoal Adsorption Test will include the time when the source was removed from the glass tube.

c. Samples will be analyzed by the Laboratory using appropriate methods and results will be returned to requestor.

6. EVALUATION.

a. Radium Sources - If the leak test reveals the presence of 0.001 microcuries or more of removable contamination, it shall be immediately withdrawn from use and disposed of in accordance with this SOP.

b. Other Sources - If the leak test reveals the presence of 0.005 microcuries or more of removable contamination, it shall be immediately withdrawn from use and disposed of in accordance with this SOP.

7. DISPOSAL OF LEAKING SOURCES.

All sources found to be leaking greater than the values specified in para 6, above, will be handled in accordance with 10CFR 35.14 and 10 CFR 20, and will be immediately withdrawn from use, decontaminated and repaired or disposed of in accordance with applicable Federal, Army and State regulations.

8. INVENTORY AND LEAK TEST RECORDS FOR SEALED SOURCES.

a. A Record of Sealed Source Inventory and Leak Testing for each sealed source will be maintained by the Radioactive Materials Control Branch. The Record of Sealed Source Inventory and Leak Testing will contain the following information:

- (1) Specific items of equipment or radioisotope
- (2) Serial number
- (3) Health Physics control number
- (4) Location of items
- (5) Radiation levels
- (6) Radioactivity
- (7) NRC or DA authorization numbers
- (8) Receipts, transfers, and local disposals

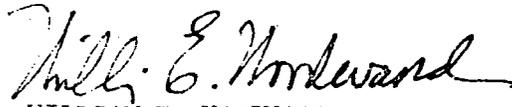
26 March 1982

- (9) Date of inventory and name of person making the inventory
- (10) WRAMC Radioactive Material Authorization number

b. The Record of Sealed Source Inventory and Leak Testing will also serve as a record of leak testing. Consecutive entries will be made for each test and include the date, activity detected in microcuries, and initials of person performing test.

9. REFERENCES.

- a. Title 10, Code of Federal Regulations, Chapter 1, US Nuclear Regulatory Commission Rules and Regulations.
- b. AR 40-37, Radioisotope License Program (Human-Use), 7 January 1977.
- c. AR 385-11, Safety - Ionizing Radiation Protection, 1 May 1980.
- d. NCRP Reports 28, 30, 33, 34 and 40.
- e. NBS Handbook 114.



WILLIAM E. WOODWARD  
LTC, MSC  
Health Physics Officer

**PART 30 • RULES OF GENERAL APPLICABILITY TO DOMESTIC LICENSING**

Element (atomic number)	Isotope	Col. I	Col. II
		Gas concentration $\mu\text{Ci}/\text{ml}^*$	Liquid and solid concentration $\mu\text{Ci}/\text{ml}^*$
Yttrium (39)	Y 90		$2 \cdot 10^{-4}$
	Y 91m		$3 \cdot 10^{-4}$
	Y 91		$3 \cdot 10^{-4}$
	Y 92		$6 \cdot 10^{-4}$
	Y 93		$3 \cdot 10^{-4}$
Zinc (30)	Zn 65		$1 \cdot 10^{-4}$
	Zn 65m		$7 \cdot 10^{-4}$
	Zn 69		$2 \cdot 10^{-4}$
Zirconium (40)	Zr 95		$6 \cdot 10^{-4}$
	Zr 97		$2 \cdot 10^{-4}$
Beta and/or gamma emitting byproduct material not listed above with half-life less than 3 years		$1 \cdot 10^{-4}$	$1 \cdot 10^{-4}$

\* Values are given only for those materials normally used as gases  
 $\mu\text{Ci}/\text{g}$  for solids

**NOTE 1:** Many radioisotopes disintegrate into isotopes which are also radioactive. In expressing the concentrations in Schedule A, the activity stated is that of the parent isotope and takes into account the daughters.

**NOTE 2:** For purposes of § 30.14 where there is involved a combination of isotopes, the limit for the combination should be derived as follows:

Determine for each isotope in the product the ratio between the concentration present in the product and the exempt concentration established in Schedule A for the specific isotope when not in combination. The sum of such ratios may not exceed "1" (i.e., unity).

**Example:**

Concentration of Isotope A in Product :

Exempt concentration of Isotope A

Concentration of Isotope B in Product  $\leq 1$

Exempt concentration of Isotope B

(30 FR 8185, June 26, 1965, as amended at 35 FR 3982, Mar. 3, 1970; 38 FR 29314, Oct. 24, 1973)

**§ 30.71 Schedule B.**

Byproduct material	Microcuries
Antimony 122 (Sb 122)	100
Antimony 124 (Sb 124)	10
Antimony 125 (Sb 125)	10
Arsenic 73 (As 73)	100
Arsenic 74 (As 74)	10
Arsenic 76 (As 76)	10
Arsenic 77 (As 77)	100
Barium 131 (Ba 131)	10
Barium 133 (Ba 133)	10
Barium 140 (Ba 140)	10
Bismuth 210 (Bi 210)	1
Bromine 82 (Br 82)	10
Caesium 109 (Cs 109)	10
Cadmium 115m (Cd 115m)	10
Cadmium 115 (Cd 115)	100

Byproduct material	Microcuries
Calcium 45 (Ca 45)	10
Calcium 47 (Ca 47)	10
Carbon 14 (C 14)	100
Cerium 141 (Ce 141)	100
Cerium 143 (Ce 143)	100
Cerium 144 (Ce 144)	1
Cesium 137 (Cs 137)	1,000
Cesium 134m (Cs 134m)	100
Cesium 134 (Cs 134)	1
Cesium 135 (Cs 135)	10
Cesium 136 (Cs 136)	10
Cesium 137 (Cs 137)	10
Chlorine 36 (Cl 36)	10
Chlorine 38 (Cl 38)	10
Chromium 51 (Cr 51)	1,000
Cobalt 58m (Co 58m)	10
Cobalt 58 (Co 58)	10
Cobalt 60 (Co 60)	1
Copper 64 (Cu 64)	100
Dysprosium 165 (Dy 165)	10
Dysprosium 166 (Dy 166)	100
Erbium 169 (Er 169)	100
Erbium 171 (Er 171)	100
Europium 152 9.2 h (Eu 152 9.2 h)	100
Europium 152 13 yr (Eu 152 13 yr)	1
Europium 154 (Eu 154)	1
Europium 155 (Eu 155)	10
Fluorine 18 (F 18)	1,000
Gadolinium 153 (Gd 153)	10
Gadolinium 159 (Gd 159)	100
Gallium 72 (Ga 72)	10
Germanium 71 (Ge 71)	100
Gold 198 (Au 198)	100
Gold 199 (Au 199)	100
Hafnium 181 (Hf 181)	10
Holmium 166 (Ho 166)	100
Hydrogen 3 (H 3)	1,000
Indium 112m (In 112m)	100
Indium 114m (In 114m)	10
Indium 115m (In 115m)	100
Indium 115 (In 115)	10
Iodine 125 (I 125)	1
Iodine 126 (I 126)	1
Iodine 127 (I 127)	10
Iodine 131 (I 131)	1
Iodine 132 (I 132)	10
Iodine 133 (I 133)	1
Iodine 134 (I 134)	10
Iodine 135 (I 135)	10
Indium 192 (In 192)	10

PART 30 • RULES OF GENERAL APPLICABILITY TO DOMESTIC LICENSING

Byproduct material	Microcuries	Byproduct material	Microcuries
Indium 114 (In 114)	100	Tellurium 125m (Te 125m)	10
Iron 55 (Fe 55)	100	Tellurium 127m (Te 127m)	10
Iron 59 (Fe 59)	10	Tellurium 127 (Te 127)	100
Krypton 85 (Kr 85)	100	Tellurium 129m (Te 129m)	10
Krypton 87 (Kr 87)	10	Tellurium 129 (Te 129)	100
Lanthanum 140 (La 140)	10	Tellurium 131m (Te 131m)	10
Lutetium 177 (Lu 177)	100	Tellurium 132 (Te 132)	10
Manganese 52 (Mn 52)	10	Tellurium 130 (Te 130)	10
Manganese 54 (Mn 54)	10	Thallium 203 (Tl 203)	100
Manganese 56 (Mn 56)	10	Thallium 201 (Tl 201)	100
Mercury 197m (Hg 197m)	100	Thallium 202 (Tl 202)	100
Mercury 197 (Hg 197)	100	Thallium 204 (Tl 204)	10
Mercury 203 (Hg 203)	10	Thallium 208 (Tl 208)	10
Molybdenum 99 (Mo 99)	100	Thallium 211 (Tl 211)	10
Neodymium 147 (Nd 147)	100	Tin 113 (Sn 113)	10
Neodymium 149 (Nd 149)	100	Tin 125 (Sn 125)	10
Nickel 59 (Ni 59)	100	Tungsten 161 (W 161)	10
Nickel 63 (Ni 63)	10	Tungsten 185 (W 185)	10
Nickel 65 (Ni 65)	100	Tungsten 187 (W 187)	100
Niobium 93m (Nb 93m)	10	Vanadium 48 (V 48)	10
Niobium 95 (Nb 95)	10	Xenon 133m (Xe 133m)	1,000
Niobium 97 (Nb 97)	10	Xenon 133 (Xe 133)	100
Osmium 185 (Os 185)	10	Xenon 135 (Xe 135)	100
Osmium 191m (Os 191m)	100	Ytterbium 175 (Yb 175)	100
Osmium 191 (Os 191)	100	Yttrium 90 (Y 90)	10
Osmium 193 (Os 193)	100	Yttrium 91 (Y 91)	10
Palladium 103 (Pd 103)	100	Yttrium 92 (Y 92)	100
Palladium 109 (Pd 109)	100	Yttrium 93 (Y 93)	100
Phosphorus 32 (P 32)	10	Zinc 65 (Zn 65)	10
Platinum 191 (Pt 191)	100	Zinc 63m (Zn 63m)	100
Platinum 193m (Pt 193m)	100	Zinc 69 (Zn 69)	1,000
Platinum 193 (Pt 193)	100	Zirconium 93 (Zr 93)	10
Platinum 197m (Pt 197m)	100	Zirconium 95 (Zr 95)	10
Platinum 197 (Pt 197)	100	Zirconium 97 (Zr 97)	10
Polonium 210 (Po 210)	0.1	Any byproduct material not listed above other than alpha emitting byproduct material	0.1
Potassium 42 (K 42)	10		
Praseodymium 142 (Pr 142)	100		
Praseodymium 143 (Pr 143)	100		
Promethium 147 (Pm 147)	10		
Promethium 149 (Pm 149)	10		
Rhenium 186 (Re 186)	100		
Rhenium 188 (Re 188)	100		
Rhodium 103m (Rh 103m)	100		
Rhodium 105 (Rh 105)	100		
Rubidium 86 (Rb 86)	10		
Rubidium 87 (Rb 87)	10		
Ruthenium 97 (Ru 97)	100		
Ruthenium 103 (Ru 103)	10		
Ruthenium 105 (Ru 105)	10		
Ruthenium 106 (Ru 106)	1		
Samarium 151 (Sm 151)	10		
Samarium 153 (Sm 153)	100		
Scandium 46 (Sc 46)	10		
Scandium 47 (Sc 47)	100		
Scandium 48 (Sc 48)	10		
Selenium 75 (Se 75)	10		
Strontium 91 (Sr 91)	100		
Silver 105 (Ag 105)	10		
Silver 110m (Ag 110m)	1		
Silver 111 (Ag 111)	100		
Sodium 24 (Na 24)	10		
Strontium 85 (Sr 85)	10		
Strontium 89 (Sr 89)	1		
Strontium 90 (Sr 90)	10		
Strontium 91 (Sr 91)	10		
Strontium 92 (Sr 92)	10		
Sulfur 35 (S 35)	100		
Tantalum 182 (Ta 182)	10		
Technetium 96 (Tc 96)	10		
Technetium 97m (Tc 97m)	100		
Technetium 97 (Tc 97)	100		
Technetium 99m (Tc 99m)	100		
Technetium 99 (Tc 99)	10		

NOTE: The reporting and record keeping requirements contained in this part have been approved by the General Accounting Office under B-180225 (R0079), (R0089), and (R0173).

(Sec. 201, Pub. L. 93-438, 88 Stat. 1242 (42 U.S.C. 5841))

[35 FR 6427, Apr. 22, 1970, as amended at 36 FR 16898, Aug. 26, 1971; 42 FR 25721, May 19, 1977]

CURRICULUM VITAE

for

WILLIAM E. WOODWARD, M.S.A., M.S.P.H.

Date & Place of Birth:

Home Address:

Home Telephone Number:

Office Address:

Health Physics Office  
Walter Reed Army Medical Center  
Washington, DC 20307

Office Telephone Number: (301) 427-5161

Degrees:

MSA - Governmental Administration [ ]  
George Washington University  
Washington, D.C.

MSPH - Radiological Health [ ]  
University of North Carolina  
Chapel Hill, NC

BS - Biology [ ]  
Virginia Military Institute  
Lexington, VA

Other Education and Training:

1980 Medical Effects of Nuclear Weapons  
Armed Forces Radiobiology Research Institute  
Bethesda, MD

1973 NBC Defense Officer's Course  
NATO School  
Oberammergau, Germany

1971 Operations Research/Systems Analysis Executive Course  
US Army Management School  
Fort Belvoir, VA

1970 Introduction to Computer Technology  
Department of Defense Computer Institute  
Washington, DC

WOODWARD, William E. (Continuation of Curriculum Vitae)

1969	Contract Administration George Washington University Washington, DC
1969	CBR Weapons Orientation Course Dugway Proving Ground, Utah
1968 & 1962	Nuclear Weapons Orientation Advanced Course Interservice Nuclear Weapons School Sandia Base, New Mexico
1968	Nuclear Hazards Training Course Interservice Nuclear Weapons School Sandia Base, New Mexico
1967	AMEDD Officer Advanced Course Fort Sam Houston, TX
1962	Medico-Military Applications for Nuclear Medical Officers Part I — National Naval Medical Center Bethesda, MD Part II — Walter Reed Army Institute of Research Washington, DC
1957	AMEDD Officer Basic Course Fort Sam Houston, TX

Chronological Experience

Jun 1981 - Present	Chief, Health Physics Office Walter Reed Army Medical Center Washington, DC 20307
Sep 1978 - Jun 1981	Biomedical Radiation Effects Staff Officer Weapons Effects Division US Army Nuclear and Chemical Agency Fort Belvoir, VA
Sep 1975 - Sep 1978	Director of Programs US Army Medical Research and Development Command Fort Detrick, MD
Jun 1972 - Sep 1975	Deputy Commander US Army Radiological Hygiene Agency, Europe Landstuhl, Germany
Jan 1968 - Jun 1972	Chief, Radiation Research Branch US Army Medical Research and Development Command Washington, DC

WOODWARD, William E. (continuation of Curriculum Vitae)

Aug 1965 - Jan 1968      Biology Department Staff  
Division of Medicinal Chemistry  
Walter Reed Army Institute of Research  
Washington, DC

Nov 1962 - Aug 1965      Chief, Radioisotope Laboratory  
US Army Tropical Research Medical Laboratory  
San Juan, Puerto Rico

Experience Summary:

Seventeen (17) years of applied Health Physics, Biomedical Radiation Effects Research, and Radiological Emergency Medical Response Planning. Currently, Director of the health physics program for Walter Reed Army Medical Center. The Center's program provides comprehensive health physics support to a 1280-bed hospital, the Walter Reed Army Institute of Research, the Armed Forces Institute of Pathology, the US Army Medical Research Institute for Infectious Diseases and certain other activities in the Washington area. The program monitors three (3) Nuclear Regulatory Commission By-Product Material Licenses and a Department of Army Authorization for naturally occurring/accelerator produced radionuclides. The program encompasses approximately 150 laboratories using radioactive materials, 160 X-ray units, 25 high intensity light sources, and 450 individuals on personnel dosimetry monitoring. Also responsible for the training, equipping and direction of the only Army Radiological Advisory Medical Team, a nuclear accident/incident control team. Previous health physics experience encompassed evaluation and administration of nuclear medicine pharmacy procedures, research and development of methods for providing protection against the effects of nuclear radiation on the battlefield, and establishment of policies and procedures for the organization, training, equipping, and testing of the US Army's Radiological Emergency Medical Response Teams. These assignments involved lecturing to staff, dosimetry and measurement, equipment specification, emergency planning and analysis of personnel radiation protection measures.

BIBLIOGRAPHY

C.J.D. Zarafonitis, H.L. Ley, Sr., D.M. Kerr, R.L. Wagner, Jr., and W. E. Woodward: "Nuclear Protection for the Soldier," Final Report of the AD HOC Committee of the Army Scientific Advisory Panel, April 1977.

JUL 18 1980

HSWP-QHP

SUBJECT: Renewal of US Nuclear Regulatory Commission License No.  
08-01738-03

THRU: ~~TSG HQDA (DASC PSP-E)~~  
Washington, DC 20310

*Waz* *18 Jul 80*  
ROBERT T. WANGEMANN  
Colonel, MSC  
Radiological Hygiene Consultant

TO: Director  
Division of Fuel Cycle and Material Safety  
Office of Nuclear Material Safety and Safeguards  
US Nuclear Regulatory Commission  
Washington, DC 20555

Enclosed are two copies of application for renewal of USNRC License No.  
08-01738-03 for Walter Reed Army Medical Center.

FOR THE COMMANDER:

1 Incl  
as (dupe)

*Patrick J. Mumma*  
PATRICK J. MUMMA  
MAJ, MSC  
Adjutant General

CF: CDR, HSC, ATTN: HSPA-P  
CDR, USAEHA, ATTN: HSE-RH

8008200413

04615

JUL 6 1980

Department of the Army  
Walter Reed Army Medical Center  
ATTN: Bernard T. Miteemeyer, MD  
Major General, MC  
Commanding  
Washington, D.C. 20012

LICENSE NO. 08-01738-03

CONTROL NO. 04015

DOCKET NO. 030-06895

SUBJECT: LICENSE RENEWAL APPLICATION

Gentlemen:

This is to acknowledge receipt of your application for renewal of the material(s) license identified above. Your application is deemed timely filed, and accordingly, the license will not expire until final action has been taken by this office.

Any correspondence regarding the renewal application should reference the control number specified and your license number.

Sincerely,

Leah Tremper

Material Licensing Branch  
Division of Fuel Cycle and  
Material Safety



**9. STORAGE OF SEALED SOURCES**

LINE NO.	CONTAINER AND/OR DEVICE IN WHICH EACH SEALED SOURCE WILL BE STORED OR USED. A.	NAME OF MANUFACTURER B.	MODEL NUMBER C.
(1)	AECL Gammacell 220 Irradiator	Atomic Energy of Canada Limited	Gammacell 220
(2)	AECL Gammacell 40 Irradiator	Atomic Energy of Canada Limited	Gammacell 40
(3)	AECL Gammacell 220 Irradiator	Atomic Energy of Canada Limited	Gammacell 220
(4)	AECL Gammacell 40 Irradiator	Atomic Energy of Canada Limited	Gammacell 40

**10. RADIATION DETECTION INSTRUMENTS**

LINE NO.	TYPE OF INSTRUMENT A.	MANUFACTURER'S NAME B.	MODEL NUMBER C.	NUMBER AVAILABLE D.	RADIATION DETECTED (alpha, beta, gamma, neutron) E.	SENSITIVITY RANGE (milliroentgens/hour or counts/minute) F.
(1)	REFERENCE:	Application for renewal of NRC Materials License - Medical, No. 08-01738-02, 18 July 1979, Tab 9.				
(2)						
(3)						
(4)						

**11. CALIBRATION OF INSTRUMENTS LISTED IN ITEM 10**

<input checked="" type="checkbox"/> a. CALIBRATED BY SERVICE COMPANY NAME, ADDRESS, AND FREQUENCY REFERENCE: Application for renewal of NRC Material License - Medical, No. 08-01738-02, 18 July 1979, Tab 10.	<input type="checkbox"/> b. CALIBRATED BY APPLICANT Attach a separate sheet describing method, frequency and standards used for calibrating instruments.
--	---

**12. PERSONNEL MONITORING DEVICES**

TYPE (Check and/or complete as appropriate.) A.	SUPPLIER (Service Company) B.	EXCHANGE FREQUENCY C.
<input type="checkbox"/> (1) FILM BADGE  <input type="checkbox"/> (2) THERMOLUMINESCENCE DOSIMETER (TLD)  <input type="checkbox"/> (3) OTHER (Specify): _____ _____ _____	REFERENCE: Application for renewal of NRC Materials License - Medical, No. 08-1738-02, 18 July 1979, page 3 of Form NRC-313M.	<input type="checkbox"/> MONTHLY  <input type="checkbox"/> QUARTERLY  <input type="checkbox"/> OTHER (Specify): _____ _____ _____

**13. FACILITIES AND EQUIPMENT** (Check where appropriate and attach annotated sketch(es) and description(s).)

<input checked="" type="checkbox"/> a. LABORATORY FACILITIES, PLANT FACILITIES, FUME HOODS (Include filtration, if any), ETC. <input checked="" type="checkbox"/> b. STORAGE FACILITIES, CONTAINERS, SPECIAL SHIELDING (fixed and/or temporary), ETC. <input type="checkbox"/> c. REMOTE HANDLING TOOLS OR EQUIPMENT, ETC. <input type="checkbox"/> d. RESPIRATORY PROTECTIVE EQUIPMENT, ETC.	SEE SUPPLEMENT NO. 1.
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**14. WASTE DISPOSAL**

a. NAME OF COMMERCIAL WASTE DISPOSAL SERVICE EMPLOYED
b. IF COMMERCIAL WASTE DISPOSAL SERVICE IS NOT EMPLOYED, SUBMIT A DETAILED DESCRIPTION OF METHODS WHICH WILL BE USED FOR DISPOSING OF RADIOACTIVE WASTES AND ESTIMATES OF THE TYPE AND AMOUNT OF ACTIVITY INVOLVED. IF THE APPLICATION IS FOR SEALED SOURCES AND DEVICES AND THEY WILL BE RETURNED TO THE MANUFACTURER, SO STATE.  Sealed sources specified in this application will be returned to the manufacturer for disposal.

04615

**INFORMATION REQUIRED FOR ITEMS 15, 16 AND 17**

Describe in detail the information required for Items 15, 16 and 17. Begin each item on a separate page and key to the application as follows:

15. **RADIATION PROTECTION PROGRAM.** Describe the radiation protection program as appropriate for the material to be used including the duties and responsibilities of the Radiation Protection Officer, control measures, bioassay procedures (*if needed*), day-to-day general safety instruction to be followed, etc. If the application is for sealed source's also submit leak testing procedures, or if leak testing will be performed using a leak test kit, specify manufacturer and model number of the leak test kit.
  
16. **FORMAL TRAINING IN RADIATION SAFETY.** Attach a resume for each individual named in Items 6 and 7. Describe individual's formal training in the following areas where applicable. Include the name of person or institution providing the training, duration of training, when training was received, etc.
  - a. Principles and practices of radiation protection.
  - b. Radioactivity measurement standardization and monitoring techniques and instruments.
  - c. Mathematics and calculations basic to the use and measurement of radioactivity.
  - d. Biological effects of radiation.
  
17. **EXPERIENCE.** Attach a resume for each individual named in Items 6 and 7. Describe individual's work experience with radiation, including where experience was obtained. Work experience or on-the-job training should be commensurate with the proposed use. Include list of radioisotopes and maximum activity of each used.

SEE SUPPLEMENT NO. 2.

**18. CERTIFICATE**

*(This item must be completed by applicant)*

*The applicant and any official executing this certificate on behalf of the applicant named in Item 2, certify that this application is prepared in conformity with Title 10, Code of Federal Regulations, Part 30, and that all information contained herein, including any supplements attached hereto, is true and correct to the best of our knowledge and belief.*

**WARNING.**—18 U.S.C., Section 1001; Act of June 25, 1948; 62 Stat. 749; makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

a. LICENSE FEE REQUIRED <i>(See Section 170.31, 10 CFR 170)</i>	b. CERTIFYING OFFICIAL ( <i>Signature</i> ) 
	c. NAME ( <i>Type or print</i> ) BERNHARD T. MITTEMEYER, MD
(1) LICENSE FEE CATEGORY:	d. TITLE Major General, MC Commanding
(2) LICENSE FEE ENCLOSED: \$	e. DATE 18/7/80

S U P P L E M E N T    N O. 1

Item 13, Form NRC-313(I), Facilities and Equipment Renewal Application for NRC  
NRC License 08-01738-03

1. Item 13a, Facilities:

a. AECL Gammacells listed on lines number 1 and 2, Item 8 of this application are located on the ground level of Building 40, Room B099, Walter Reed Army Institute of Research (WRAIR), Walter Reed Army Medical Center, Washington, DC. The Gammacell 220 is located in the northeast corner of Room B099. The Gammacell 40 is located in the irradiation suite of Room B099. Since the irradiation suite was designed for X-ray use, it is constructed with lead-lined walls, door, and a thick concrete ceiling. The only entrance to Room B099 is a door located in the southwest corner. A diagram of Room B099 is attached as Inclosure 1 to this supplement.

b. AECL Gammacells listed on lines number 3 and 4, Item 8 of this application are located on the ground level of Building 1425, Room AA413, USAMRIID, Fort Detrick, MD. Since Room AA413 was designed as an irradiation suite, the walls and ceiling are constructed of high density concrete of 12" and 16" thickness respectively. The room is bordered on two sides by biological hot suites and on two sides by infrequently used hallways. The overhead area is a pipe and ventilation crawl space which would be occupied only in case of repairs. A diagram of Room AA413 is attached as Inclosure 2 to this supplement.

2. Item 13b, Storage Facilities, Containers and Special Shielding:

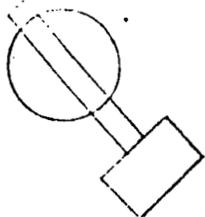
AECL Gammacells listed in Item 8 of this application will be permanently used and stored in the locations specified above. Since the sealed sources will not be removed from their respective Gammacell units, no additional containment or shielding is required.

3. Item 13c and d, Remote Handling Tools and Respiratory Protective Equipment:

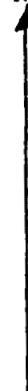
Since the sealed sources are an integral part of the Gammacell unit, no remote handling tools, equipment or respiratory protective equipment is required for operations involving use of the Gammacell units. Equipment that could be utilized to respond to an unforeseen emergency is specified in the application for renewal of NRC Material License - Medical, No. 08-01738-02, 18 July 1979, Tab 11.

Hall-  
way

X-ray  
Unit



N



Fill

GAMMACELL

40

Pb Glass

X-ray  
control

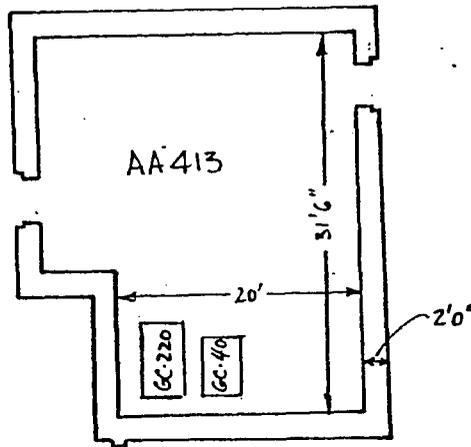
-GAMMA-  
CELL

220

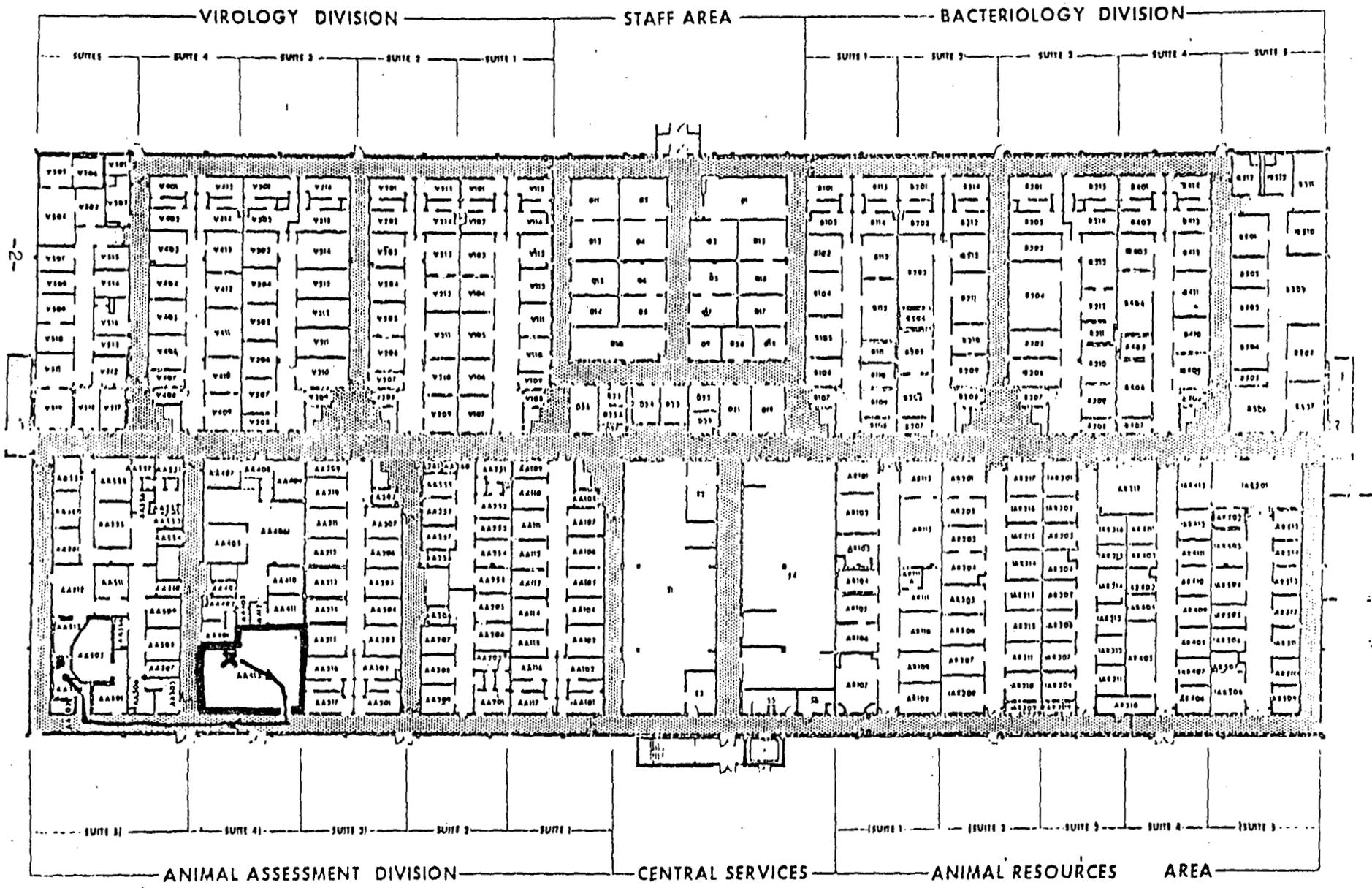
ROOM B099

LAB

No Scale



1-1-73



S U P P L E M E N T    N O.   2

Items 15, 16 and 17, Form NRC-313(I), Renewal Application for NRC License  
No. 08-01738-03

1. Item 15, Radiation Protection Program:

a. Radiation Protection Officer's duties and responsibilities are enumerated in AR 40-37, "Medical Services - Licensing and Control of Radioactive Materials for Medical Purposes," Appendix B, 7 January 1977. See Inclosure 1 to this supplement.

b. Radiation Control Committee's duties and responsibilities are enumerated in the application for renewal of NRC Materials License - Medical, No. 08-01738-02, 18 July 1979, Tab 7.

c. The procedure for obtaining authorization to use radioactive material under Walter Reed Army Medical Center's Nuclear Regulatory Commission Licenses is enumerated in the application for renewal of NRC Materials License - Medical, No. 08-01738-02, 18 July 1979, Tab 8.

d. Operating and safety procedures for AECL Gammacell 220 Irradiator and Gammacell 40 Irradiator are attached as Inclosures 2 and 3 respectively to this supplement.

(1) Any proposed modifications to a Gammacell unit, including all proposed deviations from established operational or administrative procedures shall be submitted to WRAMC Radiation Control Committee. This committee shall review such proposals and determine whether or not they are advantageous to the operation of a Gammacell unit. All proposals will be classified in one of the following categories.

(a) Major Safety Change: Any change which affects the degree of hazard associated with the operation of an AECL Gammacell unit.

(b) Minor Safety Change: Any change not classified as a major change which is directly associated with the safety of a Gammacell unit. Included in this category are changes in the principal administration and operational procedures, health physics procedures and mechanical or electrical system alterations to a Gammacell unit.

(c) Routine Change: Changes which have no bearing on the safety characteristics of a Gammacell unit.

(2) All major and minor safety changes require the approval of the WRAMC Radiation Control Committee prior to requesting approval of proposed changes, through appropriate channels, from the Nuclear Regulatory Commission.

SUPPLEMENT NO. 2 (Continued)

e. Leak testing procedures shall be performed in accordance with the applicable sections of HSWP-QHP Standard Operating Procedure Number 1-6, "Leak Testing and Inventory of Sealed Sources," 16 July 1980 (Inclosure 4).

2. Item 16, Formal Training in Radiation Safety; and Item 17, Experience:

a. Individuals who will use or directly supervise use of licensed material specified in this application must be approved by the WRAMC Radiation Control Committee in accordance with the procedures delineated in the application for renewal of NRC Material License - Medical, No. 08-01738-02, 18 July 1979, Tabs 7 and 8.

b. A resume of the training experience for CPT Dennis A. Stevenson, Health Physics Officer, WRAMC, is attached as Inclosure 5 to this supplement.

ARMY REGULATION }  
No. 40-37

HEADQUARTERS  
DEPARTMENT OF THE ARMY  
WASHINGTON, DC, 7 January 1977

**MEDICAL SERVICES**  
**LICENSING AND CONTROL OF RADIOACTIVE MATERIALS**  
**FOR MEDICAL PURPOSES**

*Effective 1 February 1977*

*This is a complete revision of AR 40-37 and reflects the current requirements of the Nuclear Regulatory Commission as published in Title 10, Code of Federal Regulations, for the use and control of radioactive materials for medical purposes worldwide. Supplementation of this regulation is prohibited, except upon approval of The Surgeon General [HQDA (DASG-HCH) WASH DC 20310]. This regulation does not apply to the USAR and NBG.*

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Scope.....	2	1
Explanation of terms.....	3	2
Responsibilities.....	4	3
Reporting requirements.....	5	5
Applications for NRC licenses.....	6	5
DA radioactive materials authorization.....	7	6
Applications for DA radioactive materials authorization.....	8	6
Use of radioactive material for in vitro testing.....	9	6
Control of needles and syringes.....	10	6
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G. Radioactive Contamination Guides.....		G-1

1. Purpose. The purpose of this regulation is to—
  - a. Prescribe policies and procedures for the use and control of radioactive materials for medical purposes.
  - b. Prescribe procedures for obtaining Nuclear Regulatory Commission (NCR) licenses and amendments.
  - c. Prescribe procedures for obtaining Department of the Army (DA) radioactive material authorizations and amendments for radioactive materials not controlled or licensed by the NRC.

- d. Establish procedures for the reporting of radioactive materials used in medical programs.
2. Scope. This regulation—
  - a. Applies to all Army medical facilities producing, procuring, storing, possessing, shipping, transferring, using, and disposing of radioactive materials for medical purposes worldwide.
  - b. Does not negate or supersede any NRC or Food and Drug Administration (FDA) requirements pertaining to the control, safeguard, and use of radioactive materials for medical purposes.

*Partick*  
*Aug 29/57*

\*This regulation supersedes AR 40-37, 12 August 1963.

Vncl 1 to Supl 2 to Item 15, Form NRC 313(I)

## APPENDIX B RADIATION PROTECTION OFFICER

**B-1.** The RPO is an individual designated by the commander to provide consultation and advice on the degree of hazards associated with radiation and the effectiveness of the measures to control these hazards. In addition, he will supervise the radiation protection program (AR 40-14).

**B-2.** Organizationally, the RPO will be in a position wherein he can effectively advise the commander and the radiation workers on all matters pertaining to radiation protection.

**B-3.** Responsibilities of the RPO will include, but not be limited to:

*a.* Providing the commander, Radioisotope/Radiation Control Committee and radiation workers with advice and assistance on all matters pertaining to radiation protection. This includes instructing and training of workers (users) and visitors in the safe use of protective equipment and radiation producing devices (AR 40-5 and AR 40-14).

*b.* Providing guidance on types of protective clothing and equipment required and its proper use (AR 40-5).

*c.* Reviewing radiological operations to determine compliance with regulations and approved procedures.

*d.* Reviewing or preparing SOP for operations involving sources of ionizing radiation prior to approval by the Radioisotope/Radiation Control Committee (AR 40-5).

*e.* Reviewing and approving the procurement of all radioactive material and radiation producing devices.

*f.* Insuring that proper personnel monitoring devices are used and that necessary bioassays are performed and required records are maintained of the results (AR 40-5 and AR 40-14).

*g.* Insuring that radiation survey/detection instruments used in radiation protection are properly calibrated and are available to radiation workers (AR 40-5 and TB 43-180).

*h.* Insuring that all radiation shields, containers and handling equipment are maintained in satis-

factory condition (AR 40-5).

*i.* Insuring the proper posting of any radiation warning signs (AR 385-30).

*j.* Maintaining a current inventory of radioactive materials and a registry of radiation producing devices.

*k.* Maintaining the required radiation protection records (AR 340-18-6).

*l.* Conducting a physical inventory of radioactive materials at least once every 3 months.

*m.* Performing radiation surveys and leak tests or insuring that such surveys and leak tests are performed. The accuracy of tests and surveys, if performed by others, remains the responsibility of the RPO (AR 40-5).

*n.* Evaluating the hazard potential and adequacy of protective measures for existing and proposed operations (AR 40-5).

*o.* Monitoring incidents wherein unusual levels of radiation or radioactive contamination are suspected (AR 40-5).

*p.* Insuring that all radioactive materials are properly used, stored, handled, shipped and disposed of in accordance with applicable directives (AR 40-5).

*q.* Formulating and implementing the radiation protection program.

*r.* Investigating radiation accidents/incidents and overexposures to determine the cause and taking steps to prevent recurrence (AR 40-5 and AR 40-14).

*s.* Terminating a project or procedure involving the use of radioactive material or radiation producing device which is found to be a threat to health or property.

**B-4.** The RPO will act as executive agent for all NRC licenses and DA radioactive material authorizations for the possession, use and storage of radioactive material.

**B-5.** The RPO should be a member of the following installation/activity committees if such committees have been established (the name of the committees may vary):

- a. The Radioisotope/Radiation Control Committee (AR 40-14).
- b. The reactor Safeguards Committee (AR 385-80).
- c. The Safety and Health Committee (AR 385-10).

- d. The Accelerator Facility Safety Committee.
- e. The Human Use Committee, if radioactive material is used (AR 40-38).
- f. The Clinical Investigation Committee, if radioactive material is used (AR 40-38).
- g. The Radioactive Drug Research Committee.

HEALTH PHYSICS  
WALTER REED ARMY MEDICAL CENTER  
Washington, D.C. 20012

HSWP-QHP  
SOP Number

OPERATING AND SAFETY PROCEDURES FOR  
AECL GAMMACELL 220 IRRADIATOR

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Safety Features . . . . .	5
Safety/Emergency Procedures . . . . .	6
References . . . . .	7

1. GENERAL

a. The Gammacell 220 (GC-220) shall be used (operated) by, or under the direct supervision of individuals designated by the Walter Reed Army Medical Center (WRAMC) Radiation Control Committee, Deputy Commander, WRAMC, Chairman.

b. The authorized Principal User is directly responsible for the control and safe use of this irradiator and will designate individuals to operate the GC-220 as approved by the WRAMC Radiation Control Committee.

c. The GC-220 shall be used for medical research and development in radiation biology and radiation dosimetry.

2. DEFINITIONS

Because the precise meaning given to one or more critical terms frequently determines the interpretation of a statement, the following definitions are given for certain words and phrases as they are used in this document:

a. "Shall" - denotes that the ensuing recommendation is necessary or essential to meet the currently accepted standards of radiation protection.

b. "Should" (is recommended) - indicates advisory recommendations that are to be applied when practicable.

c. "Explosive" - explosives are either solid or liquid, either mixtures or single compounds, and act by explosive chemical reaction, liberating at high speed heat and gas, which causes tremendous pressure.

d. "Flammable" - materials capable of being easily ignited; preferred to "inflammable" because of possible ambiguity of the in prefix.

Incl 2 to Supl 2 of Item 15, Form NRC 313(I)

e. "Individual" and/or "Operator" - a person designated by the authorized Principal User as approved by the WRAMC Radiation Control Committee, to operate the AECL Gammacell 220 Irradiator.

f. "Emergency" - an unforeseen combination of circumstances (e.g., failure of an interlock or safety device, fire, ruptured or leaking source, etc.) that poses a threat to personnel or property by ionizing radiation.

### 3. RESPONSIBILITIES

#### a. The authorized Principal User:

(1) Ensuring that the GC-220 is operated only by individuals authorized to do so by the WRAMC Radiation Control Committee and in accordance with the conditions of WRAMC Radioactive Material Authorization.

(2) Instruction of individuals in safe operating procedures in accordance with instructions outlined herein. He shall promulgate rules for working safety, including any restrictions of the operating technique known to be necessary.

(3) Ensuring that these instructions and references contained in para 7 are available at the GC-220 unit at all times.

(4) Promptly reporting any source malfunction, accident, or other unplanned occurrence that could result in an unsafe condition or exposure to personnel to the WRAMC Health Physics Officer (301-427-5107).

(5) Assure that all personnel operating the unit are monitored by appropriate personnel monitoring devices.

(6) Assure that personnel operating the unit have been instructed in the hazards and nature of injuries resulting from overexposure to ionizing radiation [e.g., attendance at appropriate WRAMC personnel training programs (HSWP-QHP Memo #2)].

#### b. WRAMC Health Physics:

(1) Conducting routine radiation protection surveys and inspections.

(2) Providing technical assistance as required.

(3) Providing calibration and routine maintenance services for radiation detection and measuring instruments required in WRAMC Radioactive Material Authorization.

#### c. Individual Operators:

(1) Operating the unit in accordance with the operation and safety procedures delineated in this SOP.

(2) Recording all pertinent information in the operating log maintained by the authorized Principal User.

(3) Being familiar with the content of these instructions, requirements of the WRAMC authorization, and other regulations as may be prescribed by the authorized Principal User.

(4) Locking the GC-220 unit and the room upon completion of use.

(5) Ensuring that the keys to the unit and the room door are properly secured to prevent unauthorized use.

(6) Reporting all malfunctions, accidents, and any other unplanned occurrence that could result in an unsafe condition or exposure of personnel promptly to the authorized Principal User.

#### 4. OPERATING PROCEDURES.

a. Insert key in keyswitch and turn clockwise 90°.

b. Raise the drawer by pressing the UP rocker switch.

c. To open the collar doors, press and hold in the button on the top of the door interlock, grasp the right hand door handle, pull back the latch lever, release the button and pull the doors open.

d. Slide the sample chamber locking ring to the right, remove the door by lifting it up and outwards.

e. Place the sample in the chamber. The access tube in the drawer top accommodates accessory tubes and electrical leads, which should be fitted in accordance with the instructions provided in the Gammacell 220 Accessories Manual.

f. Replace the sample chamber door with a forward and downward motion. Move the locking ring to the left until it snaps into position. If difficulties are experienced, check that the door is correctly positioned in the port.

g. To close the collar doors, press and hold in the button on the top of the door interlock. Grasp the right hand door handle, pull back the latch lever, release the button and push the doors closed.

h. If automatic operation is desired set the irradiation time in the following manner:

(1) Push the timer reset knob, turn it clockwise 90°, and release; the white line on the knob should be horizontal.

(2) Open the hinged cover which protects the predetermining drums; turn the knurled wheels either direction until the desired number sequence appears in the windows.

(3) Rotate the selector switch to hours, minutes or seconds. Close the hinged cover and turn the timer reset knob counterclockwise; the white line on the knob should be vertical, press the reset knob to set the timer.

(4) Push the DOWN switch. The drawer will lower to the irradiating position, activate the timer, and remain there until the preset time interval has elapsed, when it will automatically raise.

i. If manual operation is desired rotate the selector switch to MANUAL and press the DOWN switch. The drawer will lower and remain there indefinitely until the UP switch is operated.

j. To remove the sample repeat steps b - d.

## 5. SAFETY FEATURES

There are a variety of safety features incorporated into the unit for the protection of the operator.

a. Three microswitches are mounted on the collar door to ensure that:

(1) The sample chamber door is properly located.

(2) The locking ring is in position.

(3) Both collar doors are closed.

b. A fourth microswitch is located on the top shielding plug to ensure that the plug is closed.

c. Unless all four microswitches are actuated the drive motor will not start.

d. The self-locking feature of the worm gear reducer acts as a brake to prevent the drawer moving down under its own weight.

e. A solenoid-operated ram prevents the sample drawer from moving down in the event of a drive system mechanical failure.

f. Drawer movement can be arrested by switching off the electrical supply key switch.

g. A solenoid-operated door interlock ensures the collar doors can only be opened with the drawer in the safe position.

h. Top plug rest and safety column ensure the top plug can only be opened with the drawer in the full up position.

## 6. SAFETY/EMERGENCY PROCEDURES

a. The GC-220 shall be operated as described in the Atomic Energy of Canada Limited "Operator's Manual for the Gammacell 220 Cobalt 60 Irradiation Unit," edition 7, February 1978, and in accordance with this Standard Operating Procedure.

b. Emergency Procedures: See Annex A of this Standing Operating Procedure.

c. No individual shall undertake repair, perform any maintenance, remove any interlock and/or safety device, or make any changes in and/or on the GC-220 without prior approval of the authorized Principal User and the Health Physics Officer, WRAMC.

d. Under NO circumstances shall explosive material be irradiated in the GC-220.

e. All operators and/or assistants shall wear personnel monitoring devices while working around and/or operating the GC-220 Irradiator.

f. Health Physics, WRAMC, will perform leak tests, periodic inspections and radiation protection surveys.

g. An operating log shall be maintained by the authorized Principal User.

h. Key Control:

(1) Operating keys will be held under direct supervision of the authorized Principal User approved by the WRAMC Radiation Control Committee. The Principal User is responsible for assuring proper key control and key security.

(2) Duplicate keys for the GC-220 and GC-40 will be secured by the authorized Principal User.

## 7. REFERENCES

a. Atomic Energy of Canada Limited "Operator's Manual for the Gammacell 220 Cobalt 60 Irradiation Unit," edition 7, February 1978.

b. Nuclear Regulatory Commission By-Product Material License No. 08-01738-03.

1 Incl

ANNEX A - Emergency Procedures  
for AECL Gammacell  
220 Irradiator

EMERGENCY PROCEDURES  
FOR  
AECL GAMMACELL 220 IRRADIATOR

1. In the event of an emergency, malfunction, or other unusual occurrence, the following individuals shall be notified after turning the console to the OFF position:

- a. Authorized Principal User, WRAIR, Extension 576-3428.
- b. Radiation Protection Officer, WRAIR, Extension 576-3428.
- c. Health Physics Officer, WRAMC, Extension 301-427-5107.
- d. Staff Duty Officer, WRAMC (after duty hours), Extension 576-3501/2309.

The senior individual at the site shall clear the area of personnel and restrict access to the area until relieved by competent authority.

2. In the event of a fire, the following individuals shall be notified:

- a. Fire Department, WRAMC, Extension 576-3317.
- b. Authorized Principal User, WRAIR, Extension 576-3428.
- c. Radiation Protection Officer, WRAIR, Extension 576-3428.
- d. Health Physics Officer, WRAMC, Extension 301-427-5107.
- e. Staff Duty Officer, WRAMC (after duty hours), Extension 576-3501/2309.

The senior individual at the site shall clear the area of personnel and restrict access to the area until relieved by competent authority. Fire fighters may enter the area after the radiation hazard has been determined. There is little likelihood of radiation hazard unless the temperature of the source shield reaches the melting point of lead (621°F). Water should be sprayed on the source shield if there is any possibility of the temperature approaching this value.

3. Following an emergency the GC-220 shall not be operated until an inspection and a radiation protection survey have been conducted by WRAMC Health Physics.

EMERGENCY PROCEDURES  
FOR  
AECL GAMMACELL 220 IRRADIATOR

1. In the event of an emergency, malfunction, or other unusual occurrence, the following individuals shall be notified after turning the console to the OFF position:

- a. Authorized Principal User, USAMRIID, Extension 7241.
- b. Health Physics Officer, WRAMC, Phone 301-427-5107.
- c. Safety Officer, USAMRIID, Extension 7373.
- d. Staff Duty NCO, USAMRIID (after duty hours), Extension 7335.

The senior individual at the site shall clear the area of personnel and restrict access to the area until relieved by competent authority.

2. In the event of fire the following individuals shall be notified:

- a. Fire Department, Fort Detrick, Extension 7333.
- b. Authorized Principal User, USAMRIID, Extension 7241.
- c. Health Physics Officer, WRAMC, Phone 301-427-5107.
- d. Safety Officer, USAMRIID, Extension 7373.
- e. Staff Duty NCO, USAMRIID (after duty hours), Extension 7335.

The senior individual at the site shall clear the area of personnel and restrict access to the area until relieved by competent authority. Fire Fighters may enter the area after the radiation hazard has been determined. There is little likelihood of radiation hazard unless the temperature of the source shield reaches the melting point of lead (621°F). Water should be sprayed on the source field if there is any possibility of the temperature approaching this value.

3. Following an emergency the GC-220 shall not be operated until an inspection and a radiation protection survey have been conducted by WRAMC Health Physics.

HEALTH PHYSICS  
WALTER REED ARMY MEDICAL CENTER  
Washington, D.C. 20012

HSWP-QHP  
SOP Number

OPERATING AND SAFETY PROCEDURES FOR  
AECL GAMMACELL 40 IRRADIATOR

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1. GENERAL

a. The Gammacell 40 (GC-40) shall be used (operated) by, or under the direct supervision of individuals designated by the Walter Reed Army Medical Center (WRAMC) Radiation Control Committee, Deputy Commander, WRAMC, Chairman.

b. The authorized Principal User is directly responsible for the control and safe use of this irradiator and will designate individuals to operate the GC-40 as approved by the WRAMC Radiation Control Committee.

c. The GC-40 shall be used for medical research and development in radiation biology and radiation dosimetry.

2. DEFINITIONS

Because the precise meaning given to one or more critical terms frequently determines the interpretation of a statement, the following definitions are given for certain words and phrases as they are used in this document:

a. "Shall" - denotes that the ensuing recommendation is necessary or essential to meet the currently accepted standards of radiation protection.

b. "Should" (is recommended) - indicates advisory recommendations that are to be applied when practicable.

c. "Explosive" - explosives are either solid or liquid, either mixtures or single compounds, and act by explosive chemical reaction, liberating at high speed heat and gas, which causes tremendous pressure.

d. "Flammable" - materials capable of being easily ignited; preferred to "inflammable", because of possible ambiguity of the in prefix.

HEALTH PHYSICS  
WALTER REED ARMY MEDICAL CENTER  
Washington, D.C. 20012

HSWP-QHP  
SOP Number

OPERATING AND SAFETY PROCEDURES FOR  
AECL GAMMACELL 40 IRRADIATOR

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References . . . . .	7

1. GENERAL

a. The Gammacell 40 (GC-40) shall be used (operated) by, or under the direct supervision of individuals designated by the Walter Reed Army Medical Center (WRAMC) Radiation Control Committee, Deputy Commander, WRAMC, Chairman.

b. The authorized Principal User is directly responsible for the control and safe use of this irradiator and will designate individuals to operate the GC-40 as approved by the WRAMC Radiation Control Committee.

c. The GC-40 shall be used for medical research and development in radiation biology and radiation dosimetry.

2. DEFINITIONS

Because the precise meaning given to one or more critical terms frequently determines the interpretation of a statement, the following definitions are given for certain words and phrases as they are used in this document:

a. "Shall" - denotes that the ensuing recommendation is necessary or essential to meet the currently accepted standards of radiation protection.

b. "Should" (is recommended) - indicates advisory recommendations that are to be applied when practicable.

c. "Explosive" - explosives are either solid or liquid, either mixtures or single compounds, and act by explosive chemical reaction, liberating at high speed heat and gas, which causes tremendous pressure.

d. "Flammable" - materials capable of being easily ignited; preferred to "inflammable", because of possible ambiguity of the in prefix.

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e. "Individual" and/or "Operator" - a person designated by the authorized Principal User, as approved by the WRAMC Radiation Control Committee, to operate the AECL Gammacell 40 Irradiator.

f. "Emergency" - an unforeseen combination of circumstances (e.g., failure of an interlock or safety device, fire, ruptured or leaking source, etc.) that pose a threat to personnel or property by ionizing radiation.

### 3. RESPONSIBILITIES

#### a. The authorized Principal User:

(1) Ensuring that the GC-40 is operated only by individuals authorized to do so by the WRAMC Radiation Control Committee, and in accordance with the conditions of the WRAMC Radioactive Material authorization.

(2) Instruction of individuals in safe operating procedures in accordance with instructions outlined herein. He shall promulgate rules for working safety, including any restrictions of the operating technique known to be necessary.

(3) Ensuring that these instructions and references contained in para 7 are available at the GC-40 unit at all times.

(4) Promptly reporting any source malfunction, accident, or other unplanned occurrence that could result in an unsafe condition or exposure to personnel to the WRAMC Health Physics Officer (301-427-5107).

(5) Assuring that all personnel operating the unit are monitored by appropriate personnel monitoring devices.

(6) Ensuring that personnel operating the unit have been instructed in the hazards and nature of injuries resulting from overexposure to ionizing radiation (e.g., attendance at appropriate WRAMC personnel training programs - HSWP-QHP Memo No. 2)

#### b. WRAMC Health Physics:

(1) Conducting routine radiation protection surveys and inspections.

(2) Providing technical assistance as required.

(3) Providing calibration and routine maintenance services for radiation detection and measuring instruments.

#### c. Individual Operators:

(1) Operating the unit in accordance with the operation and safety procedures delineated in this SOP.

(2) Recording all pertinent information in the operating log maintained by the authorized Principal User.

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(3) Being familiar with the content of these instructions, requirements of the WRAMC authorization, and other regulations as may be prescribed by the authorized Principal User.

(4) Locking the GC-40 unit and the room upon completion of use.

(5) Ensuring that the keys to the unit and the room door are properly secured to prevent unauthorized use.

(6) Reporting all malfunctions, accidents, and any other unplanned occurrence that could result in an unsafe condition or exposure of personnel promptly to the authorized Principal User.

#### 4. OPERATION PROCEDURES

a. Insert key in the keyswitch and turn clockwise to the ON position.

b. Open the sample cavity door by holding in the door lock pushbutton and pulling on the door handle.

c. Remove the sample tray by pushing up from the underside.

d. Place the object to be irradiated in the sample tray and cover with the lid.

e. Replace the sample tray in the sample cavity ring.

f. "Chamber Air" - if ventilation to the sample cavity is required, press the "Chamber Air" button on the control panel which will illuminate white when ventilation air supply is on.

g. Close the sample cavity door and lock making sure it latches.

h. If automatic operation is desired:

(1) Press the Manual/Auto selector switch until the Auto portion of the switch is illuminated.

(2) Set the desired time interval on the timer counter. This is achieved by holding in the red reset button located at the left of the digit windows, and depressing the timer selector buttons until the desired numerals appear. Release the red button.

(3) Press the "Source on" pushbutton, both sources will move to the irradiate position and the timer will start. At the end of the preset time the source drawers will automatically move to their fully shielded safe storage position.

1. If manual operation is desired press the Manual/Auto selector switch until the manual portion of the switch is illuminated, then press the "Source On" pushbutton. The sources will remain in the irradiate position until the "Source Off" switch is operated.

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## 5. SAFETY FEATURES

Several safety features have been incorporated into the unit for the protection of operating personnel:

a. The source drawers are mechanically interlocked with the sample cavity door to ensure that:

(1) The sample cavity door cannot be opened when the source drawers are in the irradiate position.

(2) The source drawers cannot move into the irradiate position when the sample cavity door is open, or is not completely closed.

b. The mechanical lock on the sample cavity door is electrically interlocked to prevent the door from being opened when either source is not in its fully shielded safe storage position.

c. In the event of a power failure occurring during an irradiation, the source drawers will automatically return to the safe position. After power is restored, the "Source On" pushbutton must be pressed to continue the irradiation.

d. A pressure sensing switch is incorporated in the pneumatic system which will cause the source drawers to return to the safe position if the air pressure drops below 40 psig. Should this situation occur, the Low Air Indicator lamp on the control panel will be illuminated.

## 6. SAFETY/EMERGENCY PROCEDURES

a. The GC-40 shall be operated as described in the Atomic Energy of Canada Limited "Instruction Manual Gammacell 40 Caesium 137 Irradiation Unit," edition No. 3, September 1977, and in accordance with this Standing Operating Procedure.

b. Emergency Procedures: See Annex A of this Standing Operating Procedure.

c. No individual shall undertake repair, perform any maintenance, remove any interlock and/or safety device, or make any changes in and/or on the GC-40 without prior approval of the authorized Principal User and the Health Physics Officer, WRAMC.

d. Under NO circumstances shall explosive material be irradiated in the GC-40.

e. All operators and/or assistants shall wear personnel monitoring devices while working around and/or operating the GC-40 irradiator.

f. Health Physics, WRAMC, will perform leak tests, periodic inspections and radiation protection surveys.

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g. An operating log shall be maintained by the authorized Principal User.

h. Key Control:

(1) Operating keys will be held under direct supervision of the authorized Principal User approved by the WRAMC Radiation Control Committee. The Principal User is responsible for assuring proper key control and key security.

(2) Duplicate keys for the GC-220 and GC-40 will be secured by the authorized Principal User.

7. REFERENCES

a. Atomic Energy of Canada Limited "Instruction Manual Gammacell 40 Caesium 137 Irradiation Unit," edition No. 3, September 1977.

b. Nuclear Regulatory Commission By-Product Material License No. 08-01738-03.

1 Incl  
ANNEX A - Emergency Procedures  
for AECL Gammacell  
40 Irradiator

HSWP-QHP  
ANNEX A to Health Physics SOP Number

EMERGENCY PROCEDURES  
FOR  
AECL GAMMACELL 40 IRRADIATOR

1. In the event of an emergency, malfunction, or other unusual occurrence, the following individuals shall be notified after pressing the "Source Off" switch:

- a. Authorized Principal User, USAMRIID, Extension 7241.
- b. Health Physics Officer, WRAMC, Phone 301-427-5107.
- c. Safety Officer, USAMRIID, Extension 7373.
- d. Staff Duty NCO, USAMRIID (after duty hours), Extension 7335.

The senior individual at the site shall clear the area of personnel and restrict access to the area until relieved by competent authority.

2. In the event of fire the following individuals shall be notified:

- a. Fire Department, Fort Detrick, Extension 7333.
- b. Authorized Principal User, USAMRIID, Extension 7241.
- c. Health Physics Officer, WRAMC, Phone 301-427-5107.
- d. Safety Officer, USAMRIID, Extension 7373.
- e. Staff Duty NCO, USAMRIID (after duty hours), Extension 7335.

The senior individual at the site shall clear the area of personnel and restrict access to the area until relieved by competent authority. Fire fighters may enter the area after the radiation hazard has been determined. There is little likelihood of radiation hazard unless the temperature of the source shield reaches the melting point of lead (621°F). Water should be sprayed on the source shield if there is any possibility of the temperature approaching this value.

3. Following an emergency the GC-40 shall not be operated until an inspection and a radiation protection survey have been conducted by WRAMC Health Physics.

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ANNEX A to Health Physics SOP Number

EMERGENCY PROCEDURES  
FOR  
AECL GAMMACELL 40 IRRADIATOR

1. In the event of an emergency, malfunction, or other unusual occurrence, the following individuals shall be notified after pressing the "Source Off" switch:

- a. Authorized Principal User, WRAIR, Extension 576-3428.
- b. Radiation Protection Officer, WRAIR, Extension 576-3428.
- c. Health Physics Officer, WRAMC, Extension 301-427-5107.
- d. Staff Duty Officer, WRAMC (after duty hours), Extension 576-3501/2309.

The senior individual at the site shall clear the area of personnel and restrict access to the area until relieved by competent authority.

2. In the event of a fire, the following individuals shall be notified:

- a. Fire Department, WRAMC, Extension 576-3317.
- b. Authorized Principal User, WRAIR, Extension 576-3428.
- c. Radiation Protection Officer, WRAIR, Extension 576-3428.
- d. Health Physics Officer, WRAMC, Extension 301-427-5107.
- e. Staff Duty Officer, WRAMC (after duty hours), Extension 576-3501/2309.

The senior individual at the site shall clear the area of personnel and restrict access to the area until relieved by competent authority. Fire fighters may enter the area after the radiation hazard has been determined. There is little likelihood of radiation hazard unless the temperature of the source shield reaches the melting point of lead (621°F). Water should be sprayed on the source shield if there is an possibility of the temperature approaching this value.

3. Following an emergency the GC-40 shall not be operated until an inspection and a radiation protection survey have been conducted by WRAMC Health Physics

HEALTH PHYSICS  
WALTER REED ARMY MEDICAL CENTER  
Washington, D.C. 20012

HSWP-QHP  
\*SOP Number 1-6

16 July 1980

LEAK TESTING AND INVENTORY OF SEALED SOURCES

1. PURPOSE. The purpose of this SOP is to provide continuity in the standard leak testing procedures for sealed sources containing alpha, beta and/or gamma emitting radionuclides possessed, used and stored at WRAMC and tenant activities.

2. GENERAL.

a. Despite the fact that many precautions are taken to prevent leakage, the radioactive materials do occasionally leak from the capsule. Radioactive material which leaks from a source is a hazard in that it may become airborne or transported in some other way to become inhaled or ingested by personnel. The purpose of leak-testing sealed sources is to detect the leakage of the radionuclide before it becomes a hazard, and to comply with applicable regulations.

b. All sources at WRAMC will be leak-tested by the Health Physics Office Operations Branch.

c. Where a conflict of regulations (to include applicable USNRC Licenses and DA Authorizations) exists, the more restrictive regulation will be followed.

d. Sealed Source means any radioactive material that is inclosed in, or is to be used in, a container in a manner intended to prevent leakage of the radioactive material or any of its daughter products.

e. Leak Test Requirements:

(1) Each sealed source acquired by WRAMC and containing radioactive material, other than Hydrogen 3, with a half-life greater than thirty days and in any form other than gas shall be tested for contamination and/or leakage prior to use. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, the sealed source shall not be put into use until tested.

(2) Any licensed sealed source is exempt from such leak tests when the source contains 100 microcuries or less of beta and/or gamma emitting material or 10 microcuries or less of alpha emitting material.

(3) Except for alpha sources, the periodic leak test requirement specified below does not apply to sealed sources that are stored and not being used. The sources excepted from this test shall be tested for leakage prior to any use or transfer to another person unless they have been leak tested within six months prior to the date of use or transfer.

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\* This SOP supersedes HP SOP 1-6 dated 3 November 1977

16 July 1980

(4) Each sealed source containing by-product material, other than Hydrogen 3, with a half-life greater than thirty days and in any form other than gas shall be tested for leakage and/or contamination at intervals not to exceed six months except that each source designed for the purpose of emitting alpha particles shall be tested at intervals not to exceed three months.

(5) The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. The test sample shall be taken from the sealed source or from the surfaces of the device in which the sealed source is permanently or semipermanently mounted or stored on which one might expect contamination to accumulate. Records of leak test results shall be kept in units of microcuries and maintained by the Health Physics Office.

f. If there is reason to suspect that a sealed source might have been damaged, it will be tested for leakage before further use.

g. All sealed sources found to be leaking and/or contaminated will be immediately withdrawn from use by Health Physics. The Health Physics Officer will determine whether or not the source is leaking. If it is leaking, he will direct that it be resealed or disposed of in accordance with existing regulations.

### 3. SAFETY.

a. Appropriate safety measures will be observed while performing leak tests to minimize personnel exposures. Such measures will maximize the use of time, distance and shielding.

b. High intensity sources such as brachytherapy sources will not be touched. They will be handled with remote handling devices or longhandled forceps.

c. Appropriate personnel monitoring devices such as whole-body film badges, wrist film badges and self-reading dosimeters will be worn while performing leak tests.

### 4. LEAK TESTING METHODS.

a. In general, alpha, beta and gamma sealed sources are leak tested by taking a one (1) inch diameter filter paper disc and obtaining a dry or wet wipe of accessible areas of the source or source holder in which the source is permanently mounted. When taking wet wipes the solution used should not be harmful to the source capsule or holder. All exposed surfaces of the source or holder will be wiped. Paper wipes will be placed in paper envelopes or plastic bags and sent for Laboratory analysis. Care will be taken to avoid cross-contamination.

#### b. Radium Sources.

(1) Brachytherapy sources (Charcoal Adsorption Test) - Approximately 1/2 gram of activated charcoal is placed in a capped/stoppered glass tube. A wad of cotton is placed over the charcoal to separate charcoal and source. The source will remain in the sealed tube for at least 24 hours. After 24 hours, uncapped the

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tube, remove the source, immediately reseal the tube and send sample to Laboratory for analysis. A blank charcoal control sample will be sent along with each sample to distinguish environmental Radon from that produced by the source.

(2) Other radium sources - Sources too large to be tested by the method outlined in b(1), above, will be tested by using a sealable plastic bag in place of the glass tube. All other procedures will be the same as b(1).

c. Gamma Irradiators (AECL Gammacells) - Dry paper wipes will be obtained from the following locations if they are accessible:

- (1) Upper external ram.
- (2) Inside the irradiator chamber.
- (3) Lower external ram.
- (4) Floor beneath the ram.

Leak testing will be performed with the source in the unexposed position.

d. Gamma teletherapy and gamma calibration units - Dry paper wipes will be taken from selected accessible surfaces of the teletherapy head or beam port. Surfaces wiped will be those which would most likely become contaminated in case of source leakage and will include inner surfaces of beam collimating device. Extreme care will be taken not to damage or displace aiming devices during the procedures. Testing will be performed with the source in the unexposed position.

## 5. SAMPLE PROCESSING.

a. All samples will be forwarded to the Laboratory for quantitative analysis. Samples will be identified by the Health Physics Control Number of the source tested.

b. Data furnished for samples taken by the Charcoal Adsorption Test will include the time when the source was removed from the glass tube.

c. Samples will be analyzed by the Laboratory using appropriate methods and results will be returned to requestor.

## 6. EVALUATION.

a. Radium Sources - If any leakage is detected above minimum detectable activity, the source will be suspected of leaking and will be retested. The maximum value of leakage acceptable will be less than 0.001 microcuries ( $2.22 \times 10^3$  dpm).

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b. Other Sources - If any leakage is detected above minimum detectable activity, the source will be suspected of leaking and will be retested. The maximum value of leakage acceptable will be less than 0.05 microcuries of removable contamination.

7. DISPOSAL OF LEAKING SOURCES.

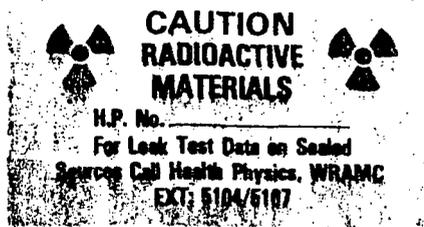
All sources found to be leaking greater than the values specified in para 6, above, will be handled in accordance with 10CFR 34.25 and 10 CFR 20, and will be immediately withdrawn from use, decontaminated and repaired or disposed of in accordance with applicable Federal, Army and State regulations.

8. Inventory of Leak Testing Records and Sealed Sources.

a. The leak testing procedure as specified in para 2e of this SOP shall constitute the inventory of sealed sources required by 10 CFR 34.25.

b. Each accountable sealed source as specified in para 2e at WRAMC will be assigned a Health Physics control number by the Radioactive Materials Control Branch.

c. Each sealed source or its container will be labeled as shown below with the Health Physics control number for that source:



d. A Record of Sealed Source Inventory and Leak Testing for each sealed source will be maintained by the Radioactive Materials Control Branch. The Record of Sealed Source Inventory and Leak Testing will contain the following information:

- (1) Specific items of equipment or radioisotope
- (2) Serial number
- (3) Health Physics control number
- (4) Location of the items
- (5) Radiation levels

16 July 1980

- (6) Radioactivity
- (7) NRC or DA authorization numbers
- (8) Receipts, transfers, and local disposals
- (9) Date of inventory and name of person making the inventory
- (10) WRAMC Radioactive Material Authorization number

e. The Record of Sealed Source Inventory and Leak Testing will also serve as a record of leak testing. Consecutive entries will be made for each test and include the date, activity detected in microcuries, and initials of person performing test.

9. REFERENCES.

- a. Title 10, Code of Federal Regulation, US NRC.
- b. AR 40-37, Radioisotope License Program (Human-Use), 7 January 1977.
- c. AR 385-11, Safety - Ionizing Radiation Protection, 1 May 1980.
- d. TB MED 249 (NBSH-73), Protection Against Radiation from Sealed Gamma Sources.
- e. TB MED 62, Diagnostic X-ray, Therapeutic X-ray and Gamma-Beam Protection for Energies Up to 10 Million Electron Volts.
- f. NRCP Reports 28, 30, 33, 34, 40 and 41.
- g. NBS Handbook 114.

  
DENNIS A. STEVENSON  
CPT, MSC  
Health Physics Officer

CURRICULUM VITAE

NAME: DENNIS A. STEVENSON  
CPT, MSC

Current Duty Assignment: Health Physics Officer  
Walter Reed Army Medical Center  
Washington, D.C. 20012

Home Address:  
Legal Residence  
Date of Birth:  
Place of Birth:

Home Telephone Number:

Office Telephone Number: (301) 427-5161

<u>EDUCATION:</u>	Ph.D.	Physics [ ] (Biophysics)	University of Delaware Newark, Delaware 19711
	M.S.	Physics [ ] (Biophysics)	University of Delaware Newark, Delaware 19711
	B.A.	Physics [ ]	Gettysburg College Gettysburg, PA

EXPERIENCE:

July 1980 - Walter Reed Army Medical Center  
Health Physics Officer/Radiation Protection Officer

1977 - July 1980 Walter Reed Army Medical Center  
Assistant Health Physics Officer  
Alternate Radiation Protection Officer  
Chief, Technical Services Branch

1977 AMEDD Officer Basic MSC Course  
Fort Sam Houston, Texas

1973 - 1977 Assistant Professor of Physics  
Northeast Louisiana University  
Monroe, Louisiana 71209  
(Radiation Safety Officer - 1976 to 1977)

1972 - 1973 Research Associate  
Department of Biophysics and Microbiology  
University of Pittsburgh, Pittsburgh, PA

Physical studies of Tobacco Mosaic Virus (TMV),  
polymerization-depolymerization of TMV protein, and the  
reconstitution of the component proteins and nucleic  
acid into a virus particle. These studies involved  
the use of the following techniques: electrophoresis,  
acid-base titration, ultracentrifugation, spectroscopy,  
electron microscopy, and radioisotopes.

STEVENSON, Dennis A. (continuation of Curriculum Vitae)

1966 - 1972 Graduate Student  
Department of Physics  
University of Delaware  
Newark, Delaware 19711

Summers Physicist  
1966 Aberdeen Proving Ground, MD  
1965

A study of atmospheric turbulence using the propagation of a laser beam through the atmosphere.

ADDITIONAL RELEVANT EXPERIENCE:

1976 - 1977 Radiation Safety Officer  
Northeast Louisiana University  
Monroe, Louisiana 71209

1973 - 1977 Designed and taught an X-ray physics class for radiologic technicians in training at several local hospitals. The course included physical and clinical aspects of X-ray technology. (2 semester course).

1974 - 1977 Designed and taught a graduate-undergraduate level biophysics course. The course involved a study of the physical properties of large biologically important molecules and the application of the concepts and techniques of physics in the study of biological systems.

1977 Designed and taught a graduate level biophysics laboratory course. The course included spectroscopy, radionuclide techniques, radiation effects and electron microscopy.

1974 Designed and taught a special graduate level course for state public health personnel working toward a graduate degree in biology. The course included the physical study of ionizing radiation and its effect on biological systems from the cellular level to man as well as the instruments used to detect and monitor these radiations.

1975 - 1977 Director of NSF sponsored program entitled "Selected Biomedical Applications of Physics" for outstanding high school juniors from throughout U.S.A.

STEVENSON, Dennis A. (continuation of Curriculum Vitae)

OTHER EDUCATION AND TRAINING:

- 1974                    Biomedical Aspects of Environmental Pollution Course,  
Oak Ridge, TN
- 1976                    External Beam, Interstitial and Intercavitary Dosimetry --  
    (1) Principles Course  
    (2) Manual and Computer Methods of Calculation  
The University of Texas Health Science Center at  
Houston, MD Anderson Hospital and Tumor Institute  
Houston, Texas
- 1978                    The Medical Effects of Nuclear Weapons Course  
Armed Forces Radiobiology Research Institute  
Defense Nuclear Agency  
Bethesda, MD 20014
- 1978                    Laser and Microwave Hazards Course  
US Army Environmental Hygiene Agency  
Aberdeen Proving Ground, Maryland 21005
- 1978                    Medical X-Ray Survey Techniques Course  
Academy of Health Sciences  
Fort Sam Houston, Texas 78234
- 1978                    Nuclear Emergency Training Exercise (NETEX)  
Interservice Nuclear Weapons School  
Kirtland AFB, New Mexico
- 1978                    Nuclear Hazards Training Course (NHTC)  
Interservice Nuclear Weapons School  
Kirtland AFB, New Mexico
- 1979                    Health Physics in Radiation Accidents Course  
Oak Ridge Associated Universities  
Oak Ridge, Tennessee
- 1979                    Nuclear Weapons Accident Exercise (NUWAX)  
DOD/DOE National Exercise  
Nevada Test Site, Nevada  
Position: Radiological Advisory Medical Team Leader

STEVENSON, Dennis A. (continuation of Curriculum Vitae)

PUBLICATIONS:

Ph.D. Thesis

"The Influence of Temperature on Globular Protein-Polyribonucleotide Interactions"

M.S. Thesis

"The Effect of Damaged Proteins on the Light Scattering Properties of Ribonucleic Acid Solutions—A Comparison of Ultraviolet and Ionizing Radiation Effects"

Preiss, John W. and Dennis A. Stevenson, "Some Parallelisms in the Behavior of Pancreatic Ribonuclease and Chicken Lysozyme Toward Homopolyribonucleotides," Biophysical Journal, 12, p.80 (1972)

Stevenson, Dennis A. and John W. Preiss, "Temperature Variation of Polyribonucleotide Conformation by an Interaction with Basic Globular Proteins," Biophysical Journal, 13, p.470 (1973)

Shugart, Cecil G., Ronald E. Smith, Larry D. Johnson, John H. Myers, and Dennis A. Stevenson. 1975. Physical Science Lab Manual. Kendall/Hunt Pub. Co., Iowa

Stevenson, Dennis A., "Biophysics of the Eye," The Louisiana Physics Teacher, 5, p.2 (1975)

MEMBERSHIP (Professional & Technical Societies/Committees)

Societies:

Biophysical Society  
The American Physical Society  
American Association for the Advancement of Science  
Sigma Xi - The Scientific Research Society of North America  
Sigma Pi Sigma - National Physics Honor Society  
Health Physics Society

Committees:

Radiation Control Committee (Member/Recorder), Walter Reed Army Medical Center  
Radioactive Drug Research Committee (Member), Walter Reed Army Medical Center  
Clinical Investigations Committee, Walter Reed Army Medical Center



DEPARTMENT OF THE ARMY  
WALTER REED ARMY MEDICAL CENTER  
WASHINGTON, D.C. 20012

IN REPLY REFER TO

HSWP-QHP

SUBJECT: Amendment of USNRC License 08-01738-03

APR 4 1979

THRU: ~~Commander  
US Army Health Service Command  
ATTN: HSPA-P  
Fort Sam Houston, TX 78234~~

*JDR*  
16 Apr 79

~~TSG HQDA (DASG-PSP-E)  
Washington, DC 20310~~

*Ad*  
24 Apr 79

ROBERT T. HANCOCK  
DASG  
Medical Systems Consultant

TO: Director  
Division of Fuel Cycle and Material Safety  
Office of Nuclear Material Safety and Safeguards  
US Nuclear Regulatory Commission  
Washington, DC 20555

1. Request that USNRC Byproduct License 08-01738-03, Expiration Date: 31 August 1980, be amended as follows:

- a. Item 6. Add: D. Cobalt 60  
E. Cesium 137
- b. Item 7. Add: D. Sealed Sources (AECL Model C 198)  
E. Sealed Sources (AECL Model C 161-Type 8)
- c. Item 8. Add: D. 26,400 Curies (no single source to exceed 26,400 Curies)  
E. 4200 Curies (no single source to exceed 2100 Curies)
- d. Item 9. Add: D. To be used in AECL Gammacell 220 Irradiator located in Building 1425, US Army Research Institute of Infectious Diseases, Ft. Detrick, Frederick, MD 21701, for medical research and development and radiation dosimetry.
- E. To be used in AECL Gammacell 40 Irradiator located in Building 1425, US Army Research Institute of Infectious Diseases, Ft. Detrick, Frederick, MD 21701, for medical

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FEE 99630

HSWP-QHP

SUBJECT: Amendmnt of USNRC License 08-01738-03

research and development and radiation dosimetry.

Change: B. To be stored in AECL Gammacell 220 Irradiator, located in Building 500, Forest Glen Section, WRAMC, Montgomery County, Maryland, pending disposal of the unit.

2. The AECL Gammacell 220 unit will be operated in accordance with the AECL Operator's Manual for the Gammacell 220 Cobalt 60 Irradiation Unit, Edition 7, dated Feb 1978, and the USAMRIID SOP (inclosure 1). The AECL Gammacell 40 will be operated in accordance with AECL Instruction Manual, Gammacell 40 Caesium 137 Irradiation Unit, Edition 3, September 1977 and the USAMRIID SOP (inclosure 2).

3. Additional supporting documentation required for this request is to be found currently on file with the NRC as supporting documents for USNRC License 08-01738-03 and in the inclosures 3 through 10.

4. Any questions or comments pertaining to this request should be directed to the Health Physics Officer, Walter Reed Army Medical Center, Washington, DC 20012. (Telephone commercial 301-427-5161, Autovon 291-5161)

FOR THE COMMANDER:

  
FRANKLIN J. GOULET  
Maj, MSC  
Adjutant

- 10 Incl
1. USAMRIID SOP: Operating and Safety Procedures for AECL Gammacell 220 Irradiator dated 13 Feb 79
  2. USAMRIID SOP: Operating and Safety Procedures for AECL Gammacell 40 Irradiator dated 13 Feb 79
  3. Drawing and description of proposed location of irradiators
  4. AECL authorization letters for A.N. Thurley and W.C. Doherty (installers)
  5. Resumes of qualifications and experience for A.N. Thurley and W.C. Doherty
  6. USNRC Byproduct Material License 54-00300-12
  7. DOT Certificate for F-147 Transfer Case-USA/6355/B
  8. Canadian Certificate for F-147 Transfer Case-CDN/2009/B(u)T
  9. DOT Certificate for AECL Gammacell 220-USA/6125/B(u)T
  10. Canadian Certificate for AECL Gammacell 220-CDN/2013/B(u)T

DEPARTMENT OF THE ARMY  
HEADQUARTERS, U.S. ARMY MEDICAL RESEARCH INSTITUTE OF INFECTIOUS DISEASES  
FORT DETRICK, FREDERICK, MARYLAND 21701

STANDING OPERATING PROCEDURE

13 February 1979

OPERATING AND SAFETY PROCEDURES FOR  
AECL GAMMACELL 220 IRRADIATOR

	Paragraph
General . . . . .	1
Definitions . . . . .	2
Responsibilities . . . . .	3
Operating Procedures . . . . .	4
Safety Features . . . . .	5
Safety Procedures . . . . .	6
References . . . . .	7

1. GENERAL.

a. The Gammacell 220 (GC-220) shall be used (operated) by, or under the supervision of individuals designated by the Walter Reed Army Medical Center (WRAMC) Radiation Control Committee, Deputy Commander, WRAMC, Chairman.

b. The Chief, Animal Assessment Division, USAMRIID is directly responsible for the control and safe use of this irradiator and will designate individuals to operate the GC-220 as approved by the WRAMC Radiation Control Committee.

c. The GC-220 shall be used for medical research and development in radiation biology and radiation dosimetry.

2. DEFINITIONS.

Because the precise meaning given to one or more critical terms frequently determines the interpretation of a statement, the following definitions are given for certain words and phrases as they are used in this document.

a. "Shall" - denotes that the ensuing recommendation is necessary or essential to meet the currently accepted standards of radiation protection.

b. "Should" (is recommended) - indicates advisory recommendations that are to be applied when practicable.

c. "Explosive" - explosives are either solid or liquid, either mixtures or single compounds, and act by explosive chemical reaction, liberating at high speed heat and gas, which causes tremendous pressure.

Incl 1

99630

d. "Flammable" - materials capable of being easily ignited; preferred to "inflammable" because of possible ambiguity of the in prefix.

e. "Individual" and/or "Operator" - a person designated by the Chief, Animal Assessment Division, USAMRIID, as approved by the WRAMC Radiation Control Committee, to operate the AECL Gammacell 220 Irradiator.

f. "Emergency" - an unforeseen combination of circumstances (e.g., failure of an interlock or safety device, fire, ruptured or leaking source, etc.) that poses a threat to personnel or property by ionizing radiation.

### 3. RESPONSIBILITIES.

#### a. The Chief, Animal Assessment Division, USAMRIID:

(1) Ensuring that the GC-220 is operated only by individuals authorized to do so by the WRAMC Radiation Control Committee.

(2) Instruction of individuals in safe operating procedures in accordance with instructions outlined herein. He shall promulgate rules for working safety, including any restrictions of the operating technique known to be necessary.

(3) Ensuring that these instructions and references contained in para 7 are available at the GC-220 unit at all times.

(4) Promptly reporting any source malfunction, accident, or other unplanned occurrence that could result in an unsafe condition or exposure to personnel to the WRAMC Health Physics Officer (6-427-5107).

#### b. WRAMC Health Physics:

(1) Conducting routine radiation protection surveys and inspections.

(2) Providing personnel dosimetry for all personnel operating the unit.

(3) Instructing operating personnel in the hazards and nature of injuries resulting from overexposure to ionizing radiation.

(4) Providing technical assistance as required.

(5) Providing calibration and routine maintenance services for radiation detection and measuring instruments.

#### c. Individual operators:

(1) Operating the unit in a safe manner at all times.

(2) Being familiar with the content of these instructions, requirements of the WRAMC authorization, and other regulations as may be prescribed by the Chief, Animal Assessment Division, USAMRIID.

(3) Locking the GC-220 unit and the room upon completion of use.

(4) Ensuring that the keys to the unit and the room door are properly secured to prevent unauthorized use.

(5) Reporting all malfunctions, accidents, and any other unplanned occurrence that could result in an unsafe condition or exposure of personnel promptly to the Chief, Animal Assessment Division, USAMRIID.

#### 4. OPERATING PROCEDURES.

a. Insert key in keyswitch and turn clockwise  $90^{\circ}$ .

b. Raise the drawer by pressing the UP rocker switch.

c. To open the collar doors, press and hold in the button on the top of the door interlock, grasp the right hand door handle, pull back the latch lever, release the button and pull the doors open.

d. Slide the sample chamber locking ring to the right, remove the door by lifting it up and outwards.

e. Place the sample in the chamber. The access tube in the drawer top accommodates accessory tubes and electrical leads, which should be fitted in accordance with the instructions provided in the Gammacell 220 Accessories Manual.

f. Replace the sample chamber door with a forward and downward motion. Move the locking ring to the left until it snaps into position. If difficulties are experienced, check that the door is correctly positioned in the port.

g. To close the collar doors, press and hold in the button on the top of the door interlock. Grasp the right hand door handle, pull back the latch lever, release the button and push the doors closed.

h. If automatic operation is desired set the irradiation time in the following manner:

(1) Push the timer reset knob, turn it clockwise  $90^{\circ}$ , and release; the white line on the knob should be horizontal.

(2) Open the hinged cover which protects the predetermining drums; turn the knurled wheels either direction until the desired number sequence appears in the windows.

(3) Rotate the selector switch to hours, minutes or seconds. Close the hinged cover and turn the timer reset knob counterclockwise; the white line on the knob should be vertical, press the reset knob to set the timer.

(4) Push the DOWN switch. The drawer will lower to the irradiating position, activate the timer, and remain there until the preset time interval has elapsed, when it will automatically raise.

i. If manual operation is desired rotate the selector switch to MANUAL and press the DOWN switch. The drawer will lower and remain there indefinitely until the UP switch is operated.

j. To remove the sample repeat steps b - d.

## 5. SAFETY FEATURES.

There are a variety of safety features incorporated into the unit for the protection of the operator.

a. Three microswitches are mounted on the collar door to ensure that:

- (1) The sample chamber door is properly located.
- (2) The locking ring is in position.
- (3) Both collar doors are closed.

b. A fourth microswitch is located on the top shielding plug to ensure that the plug is closed.

c. Unless all four microswitches are actuated the drive motor will not start.

d. The self-locking feature of the worm gear reducer acts as a brake to prevent the drawer moving down under its own weight.

e. A solenoid-operated ram prevents the sample drawer moving down in the event of a drive system mechanical failure.

f. Drawer movement can be arrested by switching off the electrical supply key switch.

g. A solenoid-operated door interlock ensures the collar doors can only be opened with the drawer in the safe position.

h. Top plug rest and safety column ensure the top plug can only be opened with the drawer in the full up position.

6. SAFETY PROCEDURES.

a. The GC-220 shall be operated as described in the Atomic Energy of Canada Limited "Operator's Manual for the Gammacell 220 Cobalt 60 Irradiation Unit," edition 7, February 1978, and in accordance with this Standard Operating Procedure.

b. In the event of an emergency, malfunction, or other unusual occurrence, the following individuals shall be notified after turning the console to the OFF position:

- (1) Chief, Animal Assessment Division, USAMRIID, Extension 7244.
- (2) Health Physics Officer, WRAMC, Phone 6-427-5107.
- (3) Safety Officer, USAMRIID, Extension 7373.
- (4) Staff Duty Officer, USAMRIID (after duty hours) Extension 7335.

The senior individual at the site shall clear the area of personnel and restrict access to the area until relieved by competent authority.

c. In the event of fire the following individuals shall be notified:

- (1) Fire Department, Fort Detrick, Extension 7333.
- (2) Chief, Animal Assessment Division, USAMRIID, Extension 7244.
- (3) Health Physics Officer, WRAMC, Phone 6-427-5107.
- (4) Safety Officer, USAMRIID, Extension 7373.
- (5) Staff Duty Officer, USAMRIID (after duty hours) Extension 7335.

The senior individual at the site shall clear the area of personnel and restrict access to the area until relieved by competent authority. Fire fighters may enter the area after the radiation hazard has been determined. There is little likelihood of radiation hazard unless the temperature of the source shield reaches the melting point of lead (621°F). Water should be sprayed on the source shield if there is any possibility of the temperature approaching this value.

d. Following an emergency the GC-220 shall not be operated until an inspection and a radiation protection survey have been conducted by WRAMC Health Physics.

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e. No individual shall undertake repair, perform any maintenance, remove any interlock and/or safety device, or make any changes in and/or on the GC-220 without the knowledge of the Chief, Animal Assessment Division.

f. Under NO circumstances shall explosive material be irradiated in the GC-220.

g. All operators and/or assistants shall wear personnel monitoring devices while working around and/or operating the GC-220 Irradiator.

h. Health Physics, WRAMC, will perform leak tests, periodic inspections and radiation protection surveys.

i. An operating log shall be maintained by the Chief, Animal Assessment Division, USAMRIID.

j. Key control.

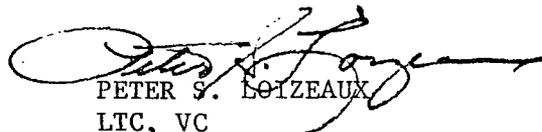
(1) Operating keys for the GC-220 and the Gammacell 40, both located in room AA 413, will be kept on a single sealed ring in order to preclude the operation of the GC-220 and the GC-40 simultaneously. Operating keys will be held in room AA 413 under direct supervision of principal investigators approved by the WRAMC Radioisotope Committee.

(2) Duplicate keys for the GC-220 and GC-40 will be secured by the Chief, Animal Assessment Division, USAMRIID.

7. REFERENCES.

a. Atomic Energy of Canada Limited "Operator's Manual for the Gammacell 220 Cobalt 60 Irradiation Unit," edition 7, February 1978.

b. Nuclear Regulatory Commission License.



PETER S. LOIZEAUX  
LTC, VC  
Chief, Animal Assessment Division

DEPARTMENT OF THE ARMY  
HEADQUARTERS, U.S. ARMY MEDICAL RESEARCH INSTITUTE OF INFECTIOUS DISEASES  
FORT DETRICK, FREDERICK, MARYLAND 21701

STANDING OPERATING PROCEDURE

13 February 1979

OPERATING AND SAFETY PROCEDURES FOR  
AECL GAMMACELL 40 IRRADIATOR

	<u>Paragraph</u>
General . . . . .	1
Definitions . . . . .	2
Responsibilities . . . . .	3
Operating Procedures . . . . .	4
Safety Features . . . . .	5
Safety Procedures . . . . .	6
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1. GENERAL.

a. The Gammacell 40 (GC-40) shall be used (operated) by, or under the supervision of individuals designated by the Walter Reed Army Medical Center (WRAMC) Radiation Control Committee, Deputy Commander, WRAMC, Chairman.

b. The Chief, Animal Assessment Division, USAMRIID is directly responsible for the control and safe use of this irradiator and will designate individuals to operate the GC-40 as approved by the WRAMC Radiation Control Committee.

c. The GC-40 shall be used for medical research and development in radiation biology and radiation dosimetry.

2. DEFINITIONS.

Because the precise meaning given to one or more critical terms frequently determines the interpretation of a statement, the following definitions are given for certain words and phrases as they are used in this document.

a. "Shall" - denotes that the ensuing recommendation is necessary or essential to meet the currently accepted standards of radiation protection.

b. "Should" (is recommended) - indicates advisory recommendations that are to be applied when practicable.

c. "Explosive" - explosives are either solid or liquid, either mixtures or single compounds, and act by explosive chemical reaction, liberating at high speed heat and gas, which causes tremendous pressure.

Incl 2

d. "Flammable" - materials capable of being easily ignited; preferred to "inflammable", because of possible ambiguity of the in prefix.

e. "Individual" and/or "Operator" - a person designated by the Chief, Animal Assessment Division, USAMRIID, as approved by the WRAMC Radiation Control Committee, to operate the AECL Gammacell 40 Irradiator.

f. "Emergency" - an unforeseen combination of circumstances (e.g., failure of an interlock or safety device, fire, ruptured or leaking source, etc.) that pose a threat to personnel or property by ionizing radiation.

### 3. RESPONSIBILITIES.

a. The Chief, Animal Assessment Division, USAMRIID:

(1) Ensuring that the GC-40 is operated only by individuals authorized to do so by the WRAMC Radiation Control Committee.

(2) Instruction of individuals in safe operating procedures in accordance with instructions outlined herein. He shall promulgate rules for working safety, including any restrictions of the operating technique known to be necessary.

(3) Ensuring that these instructions and references contained in para 7 are available at the GC-40 unit at all times.

(4) Promptly reporting any source malfunction, accident, or other unplanned occurrence that could result in an unsafe condition or exposure to personnel to the WRAMC Health Physics Officer (6-427-5107).

b. WRAMC Health Physics:

(1) Conducting routine radiation protection surveys and inspections.

(2) Providing personnel dosimetry for all personnel operating the unit.

(3) Instructing operating personnel in the hazards and nature of injuries resulting from overexposure to ionizing radiation.

(4) Providing technical assistance as required.

(5) Providing calibration and routine maintenance services for radiation detection and measuring instruments.

c. Individual operators:

(1) Operating the unit in a safe manner at all times.

(2) Being familiar with the content of these instructions, requirements of the WRAMC authorization, and other regulations as may be prescribed by the Chief, Animal Assessment Division, USAMRIID.

(3) Locking the GC-40 unit and the room upon completion of use.

(4) Ensuring that the keys to the unit and the room door are properly secured to prevent unauthorized use.

(5) Reporting all malfunctions, accidents, and any other unplanned occurrence that could result in an unsafe condition or exposure of personnel promptly to the Chief, Animal Assessment Division, USAMRIID.

#### 4. OPERATING PROCEDURES.

a. Insert key in the keyswitch and turn clockwise to the ON position.

b. Open the sample cavity door by holding in the door lock pushbutton and pulling on the door handle.

c. Remove the sample tray by pushing up from the underside.

d. Place the object to be irradiated in the sample tray and cover with the lid.

e. Replace the sample tray in the sample cavity ring.

f. "Chamber Air" - if ventilation to the sample cavity is required, press the "Chamber Air" button on the control panel which will illuminate white when ventilation air supply is on.

g. Close the sample cavity door and lock making sure it latches.

h. If automatic operation is desired:

(1) Press the Manual/Auto selector switch until the Auto portion of the switch is illuminated.

(2) Set the desired time interval on the timer counter. This is achieved by holding in the red reset button located at the left of the digit windows, and depressing the timer selector buttons until the desired numerals appear. Release the red button.

(3) Press the "Source On" pushbutton, both sources will move to the irradiate position and the timer will start. At the end of the preset time the source drawers will automatically move to their fully whielded safe storage position.

i. If manual operation is desired press the Manual/Auto selector switch until the manual portion of the switch is illuminated, then press the "Source On" pushbutton. The sources will remain in the irradiate position until the "Source Off" switch is operated.

5. SAFETY FEATURES.

Several safety features have been incorporated into the unit for the protection of operating personnel:

a. The source drawers are mechanically interlocked with the sample cavity door to ensure that:

(1) The sample cavity door cannot be opened when the source drawers are in the irradiate position.

(2) The source drawers cannot move into the irradiate position when the sample cavity door is open, or is not completely closed.

b. The mechanical lock on the sample cavity door is electrically interlocked to prevent the door from being opened when either source is not in its fully shielded safe storage position.

c. In the event of a power failure occurring during an irradiation, the source drawers will automatically return to the safe position. After power is restored, the "Source On" pushbutton must be pressed to continue the irradiation.

d. A pressure sensing switch is incorporated in the pneumatic system which will cause the source drawers to return to the safe position if the air pressure drops below 40 psig. Should this situation occur, the Low Air indicator lamp on the control panel will be illuminated.

6. SAFETY PROCEDURES.

a. The GC-40 shall be operated as described in the Atomic Energy of Canada Limited "Instruction Manual Gammacell 40 Caesium 137 Irradiation Unit," edition No. 3, September 1977, and in accordance with this Standard Operating Procedure.

b. In the event of an emergency, malfunction, or other unusual occurrence, the following individuals shall be notified after pressing the "Source Off" switch.

(1) Chief, Animal Assessment Division, USAMRIID, Extension 7244.

(2) Health Physics Officer, WRAMC, Phone 6-427-5107.

(3) Safety Officer, USAMRIID, Extension 7373.

(4) Staff Duty Officer, USAMRIID (after duty hours) Extension 7335.

13 February 1979

The senior individual at the site shall clear the area of personnel and restrict access to the area until relieved by competent authority.

c. In the event of fire the following individuals shall be notified:

- (1) Fire Department, Fort Detrick, Extension 7333.
- (2) Chief, Animal Assessment Division, USAMRIID, Extension 7244.
- (3) Health Physics Officer, WRAMC, phone 6-427-5107.
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- (5) Staff Duty Officer, USAMRIID (after duty hours) Extension 7335.

The senior individual at the site shall clear the area of personnel and restrict access to the area until relieved by competent authority. Fire fighters may enter the area after the radiation hazard has been determined. There is little likelihood of radiation hazard unless the temperature of the source shield reaches the melting point of lead ( $621^{\circ}\text{F}$ ). Water should be sprayed on the source shield if there is any possibility of the temperature approaching this value.

d. Following an emergency the GC-40 shall not be operated until an inspection and a radiation protection survey have been conducted by WRAMC Health Physics.

e. No individual shall undertake repair, perform any maintenance, remove any interlock and/or safety device, or make any changes in and/or on the GC-40 without the knowledge of the Chief, Animal Assessment Division.

f. Under NO circumstances shall explosive material be irradiated in the GC-40.

g. All operators and/or assistants shall wear personnel monitoring devices while working around and/or operating the GC-40 irradiator.

h. Health Physics, WRAMC, will perform leak tests, periodic inspections and radiation protection surveys.

i. An operating log shall be maintained by the Chief, Animal Assessment Division, USAMRIID.

j. Key control.

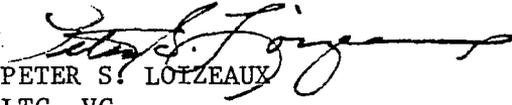
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13 February 1979

(2) Duplicate keys for the GC-220 and GC-40 will be secured by the Chief, Animal Assessment Division, USAMRIID.

7. REFERENCES.

- a. Atomic Energy of Canada Limited "Instruction Manual Gammacell 40 Caesium 137 Irradiation Unit," edition No. 3, September 1977.
- b. Nuclear Regulatory Commission License.

  
PETER S. LOIZEAUX  
LTC, VC  
Chief, Animal Assessment Division

# DISPOSITION FORM

For use of this form, see AR 340-15, the proponent agency is TAGCEN.

REFERENCE OR OFFICE SYMBOL

SUBJECT

HSWP-QHP

Room AA 413, Bldg 1425, Ft. Detrick, MD

TO Health Physics Office  
WRAMC

FROM Special Projects NCO  
HPO

DATE 23 Mar 79  
SFC Loe/acl/75104

CMT 1

Room AA413, Building 1425, Ft. Detrick, MD, was originally designed as an irradiation suite. Walls and ceiling are constructed of high density concrete of 12" and 16" thickness respectively. The room is bordered on two sides by biological hot suites and on two sides by infrequently used hallways. The room is on ground level (earth below) and the overhead area is a pipe and ventilation crawl space which would be occupied only in case of repairs.

2 Incl

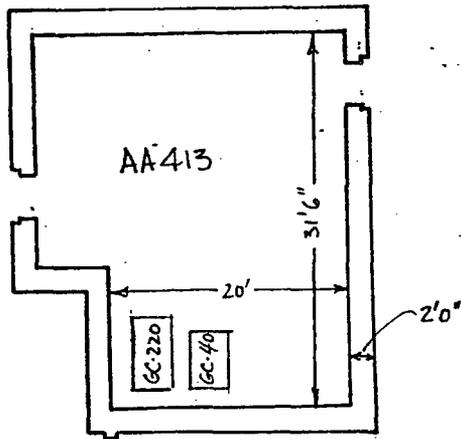
1. Drawing of Rm AA413
2. Diagram of Ground Floor  
Bldg 1425

*Ronald H. Loe*

RONALD H. LOE  
SFC, USA  
Special Projects NCO  
Health Physics Office

*Incl 3*

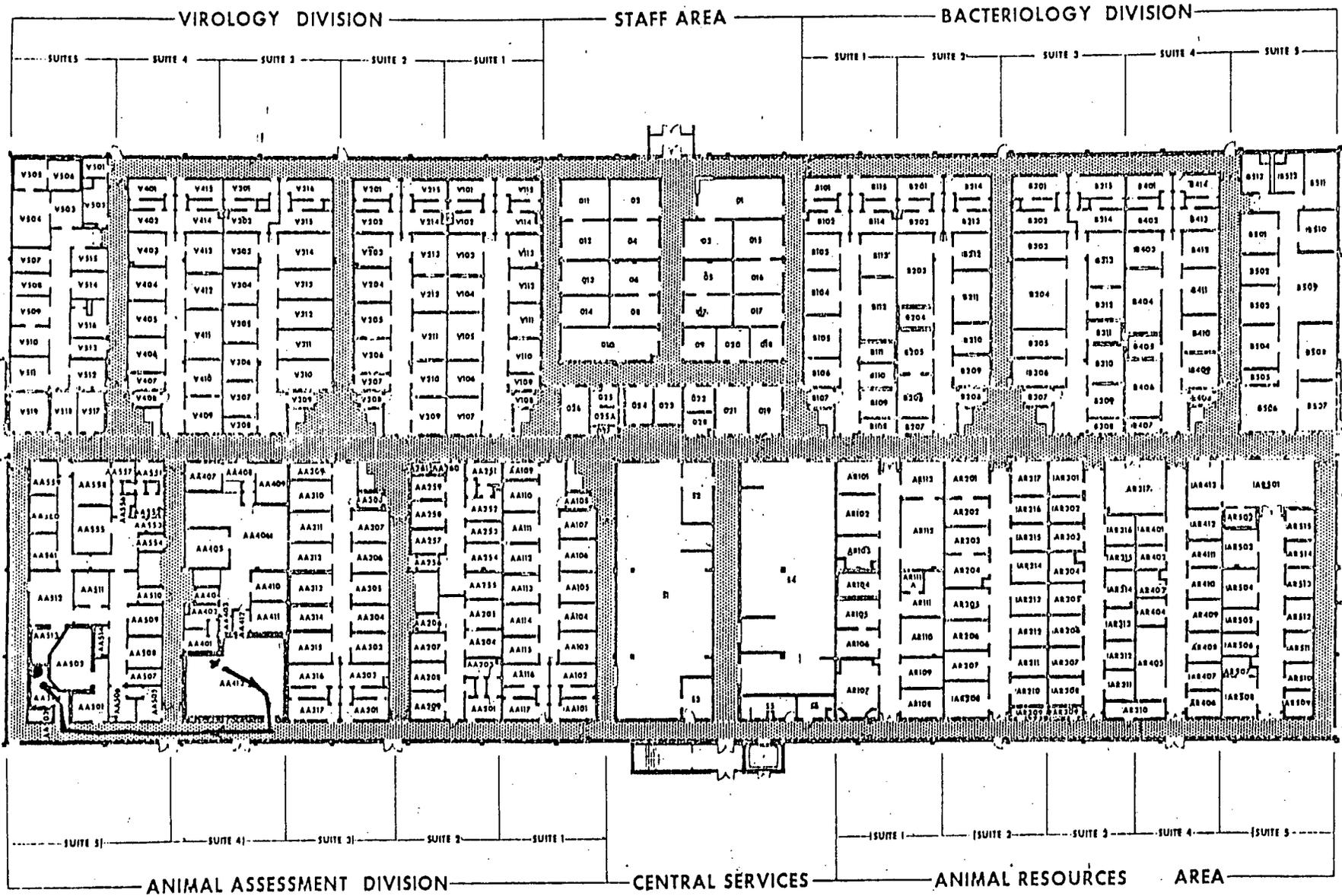
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99630

level 2 to level 3



FLOOR PHASE I PLAN



Atomic Energy  
of Canada Limited

L'Énergie Atomique  
du Canada, Limitée

Commercial Products

Produits Commerciaux

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Ottawa, Canada  
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Ottawa, Canada  
K2A 3W3

Tel. (613) 592-2790  
Telex. 053-4162

TO WHOM IT MAY CONCERN

Atomic Energy of Canada Limited, Commercial Products,  
(AECL-CP), a Crown Corporation being for all its purposes an  
agent of Her Majesty the Queen in Right of Canada, hereby designates  
..... W.C. DOHERTY .....

as an accredited Technician acting on behalf of the Corporation  
in all work areas associated with field operations on AECL-CP  
standard products. .... W.C. DOHERTY .....

is qualified to cope with the following specialized tasks:

- (a) installation of equipment(s) and its radioactive contents,
- (b) removal of equipment(s) and its radioactive contents,
- (c) servicing equipment(s) and manipulation of its radioactive contents,
- (d) refurbishing and testing radiation equipment(s),
- (e) transfer of radioactive materials,
- (f) replenishment and removal of radioactive materials,
- (g) contamination detection and decontamination procedures,
- (h) radiation surveys with approved instrumentation,
- (j) emergency procedures to be adopted in the event of an incident, and
- (k) preparation of equipment(s) and radioactive source(s) for on-going shipment.

This is to certify that ..... W.C. DOHERTY .....

has received in-house training in applied:

- (l) principles and practices of radiation protection,
- (m) radioactivity measurement standardization and monitoring techniques and instruments,
- (n) mathematics and calculations basic to the use and measurement of radioactivity, and
- (o) biological effects of radiation.

FOR: Atomic Energy of Canada Limited,  
Commercial Products.

BY: .....  
F.M. Fraser

BY: .....  
E.F. Ridout

TITLE: Industrial Products

TITLE: Product Licensing Officer,  
Product Quality Assurance.

DATE: .. 26-5-76 .....

DATE: .. 26 May, 1976 .....



Atomic Energy  
of Canada Limited

L'Énergie Atomique  
du Canada, Limitée

Commercial Products

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- (f) replenishment and removal of radioactive materials,
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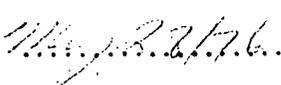
FOR: Atomic Energy of Canada Limited,  
Commercial Products.

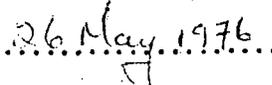
BY:   
F.M. Fraser

BY:   
E.F. Ridout

TITLE: Industrial Products

TITLE: Product Licensing Officer,  
Product Quality Assurance.

DATE: 

DATE: 

RESUME

NAME: Wayne Clayton Doherty

EDUCATION: Secondary School Graduation Grade 13  
MacKenzie High School, Deep River, Ontario

Two years of 3 year course in Chemical Engineering Technology  
Eastern Ontario Institute of Technology

EMPLOYMENT: 1964 - 6 months as student Atomic Energy of Canada,  
Chalk River, Ontario - as Reactor Operations Technician

April 1966 - October 1967 - Bell Telephone Company of Canada  
as Control Office Technician

October 1967 - present - Atomic Energy of Canada Limited,  
Commercial Products.

FIELD WORK: 1967 - 72 - Physics technician operating a research pool facility  
containing up to 150,000 curies Cobalt 60. Responsible for  
maintaining interlocks and source handling.

1972 - present - Employed as installation and service technician  
for industrial products group. Assist in the installation of several  
large irradiator sources.

1974 - Modification and source replenishment to Becton, Dickinson,  
Canaan, Connecticut medical products irradiator - approximately  
150,000 curies Cobalt 60.

1975 - Modification and source replenishment to Johnson & Johnson,  
San Angelo, Texas - approximately 250,000 curies Cobalt 60

1976 - Modification and source replenishment to Toronto Sterilized  
Products, Toronto, Ontario - approximately 250,000 curies Cobalt 60.

Over the past five years have installed numerous Gammacell 40's,  
220's, 200's and Gammabeam 150's and specialized self contained  
irradiators such as RAI, Long Island, New York and Gammabeam  
650, Raychem Corp., Red Wood City, California.

2-10 -

ON THE JOB TRAINING:

- (a) Radiation training course, Chalk River Nuclear Labs
- (b) Principles and practices of radiation protection
- (c) Radioactivity measurements standards and monitoring technique and instruments
- (d) mathematics and calculation to the use and measurement of radioactivity
- (e) in house course on biological effects of radiation.

February 7, 1978.

QUALIFICATIONS & EXPERIENCE

INSTALLATION & SERVICE CO-ORDINATOR

RESEARCH AND INDUSTRIAL IRRADIATORS

FULL NAME: Albert N. Thurley

ACADEMIC QUALIFICATIONS:

Ottawa Technical High School,  
(Honors graduate - Grade XII)

Eastern Ontario Institute of Technology,  
(First year)

EMPLOYMENT WITH AECL:

15 years

TRAINING:

On-the-job training in:

- (a) Principles and practices of radiation protection (AECL)
- (b) Radioactivity measurement standardization and monitoring techniques and instruments (AECL), and
- (c) Mathematics and calculations basic to the use and measurement of radioactivity (AEC).

AECL in-house courses on biological effects of radiation.

FIELD INSTALLATION, SERVICING, SOURCE REPLENISHMENTS AND CELL OPERATIONS ON AECL EQUIPMENTS

---

- 1. (a) Assisted licensed installer with underwater load/unload operations between shipping flasks and wet storage pool. AECL facility (March 1975) - total content 200,000 Ci Cobalt 60.
- (b) Assisted licensed installer with load/unload operations between wet storage pool and shipping flask, Hawaii Development Irradiator (January 1978) - total content 57,000 Ci Cobalt 60.

- c) Assisted licensed installer with load/unload operations between shipping flask and wet storage pool, University of Hawaii Research Irradiator (January 1978) total content 40,000 Ci Cobalt 60.
  - d) Assisted in the installation of product irradiator at Convertors, El Paso, Texas (Sept. - Oct. 77) total content 2,000,000 Ci Cobalt 60.
  - e) Assisted in the installation of IR-97 (Special) Product Irradiator at Isomecix, South Carolina - June, July and August 1978.
  - f) Assisted in the installation of JS7500 Product Irradiator at Arbrook, Scotland - November 1978.
  - g) Assisted in the installation of JS7400 Product Irradiator for USDA, in Tapachula, Mexico. December 1978 & January 1979. Total content 33,000 Ci cobalt-60.
3. Assisted licensed installer with Gammacell 200 installation in Binghampton, New York (April 1975) - total content 9,000 Ci Cobalt 60.
  4. Assisted licensed installer with Gammacell 220 removal at Fort Worth, Texas (March 1975) - total content 9,000 Ci Cobalt 60.
  5. Six months experience as a technician carrying out cell decontamination operations (AECL facility).
  6. Presently with AECL Industrial Products Group, involved in the design and on-going development of research irradiators.
  7. Has been involved with servicing Research Irradiators in Canada.
  8. Installed Gammacell 220 at the University of California, Los Angeles, California (November 1975) - total content 24,000 Ci cobalt-60.
  9. Installed Gammacell 220 at RCA Solid State, Somerville, N.J. February 1976 - total content 24,000 Ci Cobalt 60.
  10. Removed GC-220 from Fitzimons General Hospital, Denver, Colorado and reinstalled the unit at VA Hospital, Denver, Colorado (April 1976) - total content 12, Ci Cobalt 60.
  11. Removed and reinstalled GC-220 at Bell Telephone Laboratories, Murray Hill, N.J. (Feb. 1976) - total content 12,000 Ci Cobalt 60.
  12. Installed GC-220, RCA Corp., Findlay, Ohio (November 1976).
  13. Moved GC-220 at the University of Akron, Akron, Ohio (November 1976) total content 8,000 Ci Cobalt 60.

14. Additional GC-220 installations in Brazil, Venezuela and Canada.
15. Installed Gammacell 40 at Bollweevil Research Laboratory, Mississippi, State University, Mississippi (June 1977) total content 3,600 Ci Caesium 137.
16. Installed Gammacell 40 at East Carolina University, North Carolina (July 1977) - total content 3,600 Ci Caesium 137.
17. Moved Gammacell 40 at Scripps Clinic & Research Laboratories, La Jolla, California (September 1976) - total content 3,600 Ci Caesium 137.
18. Installed Gammacell 40 at Schering Corporation, Bloomfield, N.J. (September 1977) - total content 3,600 Ci Caesium 137.
19. Additional GC40 installations in Canada and Japan.
20. Removed and reinstalled Gammabeam 150 at Salk Institute, La Jolla, California (June 1977) - total content 6,000 Ci Cobalt 60.
21. Additional GB-150 installations in Munich, Germany and Halifax, Nova Scotia.

MATERIALS LICENSE

Supplementary Sheet

License Number 54-00300-12

Docket or Reference No.

Amendment No. 05

This Copy Is For Your Files

Atomic Energy of Canada Limited  
Commercial Products  
Industrial Products Division  
P. O. Box 6300, Station J  
Ottawa, Ontario, Canada K2A 3W3

In accordance with application dated December 1, 1976, License Number 54-00300-12 is amended as follows:

Subitems 6.C., 7.C., and 8.C. are amended to read:

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

C. Cobalt 60

C. Sealed sources (AECL)

C. 50,000 curies

MAR 2 1977

For the U. S. Nuclear Regulatory Commission

*Nathan Bassin*  
by Radioisotopes License Branch

Division of Materials and Fuel Cycle  
Facility Licensing  
Washington, D. C. 20555

4 001

MATERIALS LICENSE

Supplementary Sheet

License Number 54-00300-12

Docket or  
Reference No. \_\_\_\_\_

Amendment No. 04

Atomic Energy of Canada Limited  
Commercial Products  
Industrial Products Division  
P. O. Box 6300, Station J  
Ottawa, Ontario, Canada K2A 3W3

In accordance with letter dated September 7, 1976, License Number 54-00300-12  
is amended as follows:

Condition 12. is amended to read:

12. Licensed material shall be used by, or under the supervision and in the physical presence of, A. T. L. Ashfield, H. M. F. Warland, F. L. Fraser, Ian L. T. Conn, Richard G. McKinnon, Eric K. Curnow, J. deLind Van Wijngaarden, W. C. Doherty, William Richard Green, E. F. Ridout, Albert M. Thurley, Roderick Dit Hing Chu, Barrie John Jackson, Albert O'Connor Leduc, Leonard Garry Leeson, Jiri Kotler, or Stefan A. Jaeger.

For the U. S. Nuclear Regulatory Commission

by Radioisotopes Licensing Branch

Division of Fuel Cycle and  
Material Safety  
Washington, D.C. 20555

ate \_\_\_\_\_

U. S. ATOMIC ENERGY COMMISSION  
BYPRODUCT MATERIAL LICENSE

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Parts 30, 32, 33, 34, and 35, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, own, possess, transfer and import byproduct material below; and to use such byproduct material for the purpose(s) and at the place(s) designated below. 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 Atomic Energy Commission now or hereafter in effect and to any conditions specified below.

<p style="text-align: center;">Licensee</p> <p>1. Atomic Energy of Canada Limited Commercial Products Industrial Products Division</p> <p>2. P. O. Box 6300, Station J Ottawa, Ontario, Canada -K2A 3W3</p>	<p>3. License number 54-00300-12</p> <hr/> <p>4. Expiration date August 31, 1979</p> <hr/> <p>5. Reference No.</p>
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6. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radioac- tivity which licensee may possess at any one time
✓ A. Cobalt 60	A. Sealed sources (AECL)	A. 26,000 curies
B. Cobalt 60	B. Sealed sources (AECL)	B. 6,000 curies
C. Cobalt 60	C. Sealed sources (AECL)	C. 30,000 curies
U D. Cesium 137	D. Sealed sources (AECL Model C-161, Type 8)	D. 4,200 curies

9. Authorized use

- ✓ A. To be used in Atomic Energy of Canada, Ltd., Gammacell Irradiator Models 100, 200, and 220 as necessary to the installation and servicing of the Gammacell irradiators at the site of customers who possess an appropriate U. S. Atomic Energy Commission license. (See Condition 14)
- B. To be used in Atomic Energy of Canada Limited Gammabeam 150 irradiators as necessary to the installation and servicing of Gammabeam 150's at the site of customers who possess an appropriate U. S. Atomic Energy Commission license. (See Condition No. 15).
- C. To be used in Atomic Energy of Canada Limited Gammabeam 650 (Type IR23) irradiators as necessary to the installation and servicing of Gammabeam 650's at the site of customers who possess an appropriate U. S. Atomic Energy Commission license. (See Condition 16).

9. Authorized use continued

D. To be used in Atomic Energy of Canada Limited Gammacell Model 40 irradiators and shipping containers as necessary to the installation and servicing of Gammacell 40 irradiators at the site of customers who possess an appropriate U. S. Atomic Energy Commission license. (See Condition 17).

CONDITIONS

10. Byproduct material shall be used only at temporary job sites of the licensee anywhere in the United States where the U. S. Atomic Energy Commission maintains jurisdiction for regulating the use of byproduct material.
11. The licensee shall comply with the provisions of Title 10, Chapter 1, Code of Federal Regulations, Part 19, "Notices, Instructions and Reports to Workers; Inspections" and Part 20, "Standards for Protection Against Radiation."
12. Byproduct material shall be used by, or under the supervision and in the physical presence of, A. T. I. Ashfield, H. M. F. Warland, F. L. Fraser, Ian L. T. Conn, Richard G. McKinnon, Eric K. Curnow, J. deLind Van Wijngaarden, W. C. Doherty, Sidney E. Payne, or E. F. Ridout.
13. The licensee is hereby authorized to perform leak tests on the sealed sources licensed in Items 6, 7, and 8 during installation or servicing of the irradiators as authorized in Item 9. The leak tests shall be in accordance with the leak test condition on the customer's license. Such a test will satisfy the leak test requirements of the customer's license, provided that the customer is supplied the results of the leak test in microcuries and advised of the requirements for removing from service the device containing the sealed sources and reporting the results to the U. S. Atomic Energy Commission if the leak test reveals contamination in excess of that specified by his license.
14. The activities authorized in Subitem 9.A. shall be conducted in accordance with the installation procedures described in AECL manuals entitled, "Instruction Manual, Gammacell 100 and 200" submitted with letter dated July 13, 1962, "Instruction Manual, Gammacell 200," submitted with letter dated December 1, 1964, and "Instruction Manual, Gammacell 220," submitted with letter dated July 16, 1960.

Supplementary Sheet

License Number 54-00300-12

CONDITIONS

(Continued)

15. This license permits the licensee to conduct only those activities authorized in Subitem 9.B. that are specified in "INSTALLATION PROCEDURE FOR GAMMABEAM 150 IRRADIATORS" attached to application dated March 18, 1964. The foregoing procedures shall be amended to add a sentence at the end of the last paragraph under the section entitled "Assembly" as follows:

**CAUTION:** The irradiator room is not to be occupied during operational testing of the "up travel limit microswitch" or at any time when the source is in the "on" (unshielded) condition.

16. The activities authorized in Subitem 9.C. shall be conducted in accordance with the procedures described in "Installation Procedure for Gammabeam 650 (Type IR23) Irradiator", submitted with letter dated May 2, 1967. These procedures shall be amended to include that all personnel involved in such operations will wear film badges and pocket dosimeters. At least one alarm-type radiation monitor and one high range, non-blocking survey meter shall be present.

The activities authorized in Subitem 9.D. shall be conducted in accordance with the procedures described in "Gammacell 40 - Unit and Source Installation Instruction", submitted with letter dated March 31, 1971.

For the U. S. Atomic Energy Commission  
Original signed by  
FRANK C. DAVIN  
by Materials Branch  
Directorate of Licensing  
Washington, D. C. 20543

Date August 23, 1974

EX-105 - APRIL-30-1979



DEPARTMENT OF TRANSPORTATION  
MATERIALS TRANSPORTATION BUREAU  
WASHINGTON, D.C. 20590

IAEA CERTIFICATE OF COMPETENT AUTHORITY

Type B Radioactive Material Package Design

(Revision 2)

Certificate Number USA/6355/B

(Revalidation of Canadian Certificate CDN/2009/B(U))

This establishes that the packaging design described herein, when loaded with the authorized radioactive contents, has been certified on March 8, 1976, by the National Competent Authority of Canada (Appendix A), as meeting the regulatory requirements for Type B packaging for radioactive materials as prescribed in IAEA<sup>1</sup>/ Regulations and constitutes a revalidation of that certificate in accordance with §§ 49 CFR 173.393b, 173.395(b)(3); 46 CFR 146.19-100; and 14 CFR 103 of the USA<sup>2/ 3/ 4/</sup> Regulations for the transport of radioactive materials.

I. Package Identification - F-147 Transfer Case.

II. Packaging Description - Packaging authorized by Canadian Certificate CDN/2009/B(U) consists of a lead-shielded steel inner container within a steel encased wooden outer container 34 inch by 40 inch by 42 inch weighing about 3900 pounds.

III. Authorized Radioactive Contents - The authorized contents consist of radioactive materials n.o.s. as not more than 15,000 curies of cobalt-60 encapsulated in stainless steel, or not more than 8,000 curies of cesium-137 as chloride encapsulated in stainless steel.

IV. General Conditions -

a. Each user of this certificate must have in his possession a copy of this certificate.

b. Each user of this certificate, other than Atomic Energy of Canada, Limited, Ottawa, Canada, shall register his identity in writing to the Office of Hazardous Materials Operations, U.S. Department of Transportation, Washington, D.C. 20590.

c. This certificate does not relieve any consignor or carrier from compliance with any requirement of the Government of any country through or into which the package is to be transported.

V. Marking and Labeling - In addition to the markings prescribed in Canadian Certificate CDN/2009/B(U), the package must also bear the marking USA/6355/B, as well as the other marking and labels prescribed by the USA Regulations.

VI. Expiration Date - This certificate, unless renewed, expires on April 30, 1979.

This revision is issued in accordance with the requirements of the IAEA and USA Regulations and in response to the September 22, 1976 petition by Atomic Energy of Canada, Ltd, Ottawa, Canada, and in consideration of the associated information provided in Canadian Certificate CDN/2009/B(U) (Appendix A).

Certified by:

A. W. Grelfa  
A. W. Grelfa  
Chief, Technology Division  
Office of Hazardous Materials Operations  
U.S. Department of Transportation

October 13, 1976  
(DATE)

- 1/ "Safety Series No. 6, Regulations for the Safe Transport of Radioactive Materials, 1967 Edition," published by the International Atomic Energy Agency (IAEA), Vienna, Austria.
- 2/ Title 49, Code of Federal Regulations, Parts 100-199, USA.
- 3/ Title 46, Code of Federal Regulations, Part 146, USA.
- 4/ Title 14, Code of Federal Regulations, Part 103, USA.

This certificate supersedes in its entirety, DOT Special Permit 6355, with respect to international shipments.

Revision 1 issued to incorporate Canadian Certificate CDN/2009/B(U) and to revise expiration date.

Revision 2 issued to revise authorized contents.



8 March 1976

P.O. Box 1046      C.P. 1046  
Ottawa, Canada    Ottawa, Canada  
K1P 5S9            K1P 5S9

RADIOACTIVE MATERIAL TYPE B(U) PACKAGE DESIGN AND SHIPMENT  
CERTIFICATE CDN/2009/B(U)T REVISION 0

This certifies that the packaging, as described, when loaded with the authorized radioactive contents and prepared for shipment in accordance with the instructions described below; has been demonstrated to meet the regulatory requirements prescribed for package design and shipment of Type B Unilateral packages as described in the IAEA (1) and Canadian regulations (2) (3) (4) (5) as appropriate, for the transportation of radioactive material.

Each shipper under this authorization, other than the original applicant, shall register his identity with the Atomic Energy Control Board prior to his first use of this authorization and shall certify that he possesses the necessary instructions for preparation of the package for shipment.

This Certificate does not relieve the shipper and carrier from compliance with any requirement of the government of any country through or into which the package will be transported.

PACKAGING DESCRIPTION

F-147 Transfer Case as shown on Atomic Energy of Canada Limited - Commercial Products drawing TC-3-1 (latest AECB approved revision); having a lead-shielded (250 mm) steel-encased inner container containing the authorized capsule, within a 90 mm thick steel-encased wood outer impact and fire shield having external dimensions of 850 mm by 1020 mm by 1070 mm high. The containment system consists of the authorized capsule(s) and the steel-encased lead-shielded container. The total weight is 1770 kg. These packagings shall bear the competent authority identification mark "CDN/2009/B(U)" or "CDN-U9".

AUTHORIZED RADIOACTIVE CONTENTS

Not more than 15,000 curies of cobalt-60 metal doubly encapsulated in C-146 and C-151 welded type 316L stainless steel capsules or in non-AECL capsules which meet Special Form requirements. The decay heat output from this material is not greater than 250 W. Surface heat flux is not greater than  $60\text{W/m}^2$ ,

or;

not more than 8000 curies of cesium-137 as "normal form" cesium chloride pellets doubly encapsulated within C-161 welded stainless steel capsule assemblies Type 1 to 8. The decay heat output from this material is not greater than 40W.



SHIPMENT

For the purposes of design, the ambient temperature has been assumed as 38°C and the insolation as stated in Table III of (1).

The package shall be prepared for shipment in accordance with the approved procedure on the above-noted file and shall be further prepared for shipment and shipped and carried in accordance with the most recent Canadian Regulations for road(2), rail(3), marine(4), and air(5) transport and with the international regulations (1). Supplementary instructions re heat distribution are required. This certificate authorizes shipment by road, rail, marine and air transport.

This Certificate is issued in accordance with IAEA Regulations (1), the Atomic Energy Control Regulations(2), and by agreement with Canadian transportation regulatory authorities.

EXPIRY DATE

This Certificate expires 30 April 1979.

Certified by:



Endorse<sup>d</sup> by:

J. H. Jennekens  
Director - Directorate of Licensing  
Atomic Energy Control Board  
P.O. Box 1046  
Ottawa, CANADA  
(Acting competent authority for  
road transport)

E. J. Hase  
Director of Operation  
Railway Transport Committee  
Canadian Transport Commission  
Ottawa, CANADA

R. E. Bolduc, Director  
Director, Aeronautical Licensing  
and Inspection Branch,  
Civil Aviation Branch  
Department of Transport  
Ottawa, CANADA

G. W. Graves - Chairman  
Board of Steamship Inspection  
Marine Regulations Branch  
Ministry of Transport  
Ottawa, CANADA

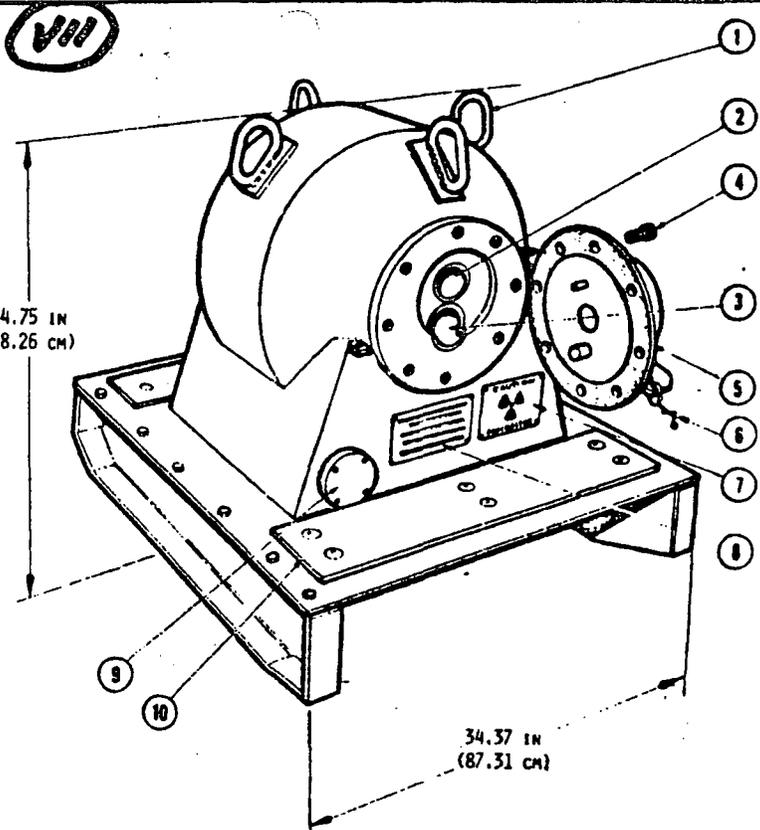
REFERENCES

- (1) IAEA "Regulations for the Safe Transport of Radioactive Materials", 1973 Edition Safety Series No. 6, International Atomic Energy Agency, Vienna STI/PUB/323.
- (2) Atomic Energy Control Regulations, SOR/74-334 dated 4 June 1974.
- (3) Regulations for the Transportation of Dangerous Commodities by Rail, as issued by the Canadian Transport Commission.
- (4) IMCO "International Dangerous Goods Code" published by the Inter-Governmental Maritime Consultative Organization, London. Authorized under Canada Shipping Act, Dangerous Goods Shipping Regulations SOR/73-327'd 14 June 1973. Refer also to National Harbours Board and St. Lawrence Seaway Authority regulations as appropriate.
- (5) IATA "Restricted Articles Regulations". Radioactive materials packaged and shipped in accordance with Part 2 of these regulations are deemed to meet the requirements of Sec 800 of the Air Regulations for Canada. See Flight Information Manual 1975 (T53-5/1975).

PARTS LIST

1. LIFT HANDLES (4)
2. SOURCE DRAWER
3. DUMMY DRAWER
4. DOOR BOLTS - 5/8 IN-11 x 1 1/2 IN LG - SOCKET HD (16)
5. GASKET - NEOPRENE (2)
6. WIRE SEALS (2)
7. RADIATION CAUTION PLATES (4)
- AECL SPEC. NO. D60096
8. AECB CERTIFICATION PLATE (4)
- AECL SPEC. NO. D60097
9. SPARE DUMMY DRAWER
10. FIREPROOF TRANSITE (2)
11. FIRESHIELD - STEEL FRAME - SHEET METAL - CEDAR
12. DOOR - LEAD SHIELDED
13. LEAD SHIELDING
14. FIRESHIELD BOLTS - 0.5 IN-13 x 2.5 IN LG HEX HD (12)

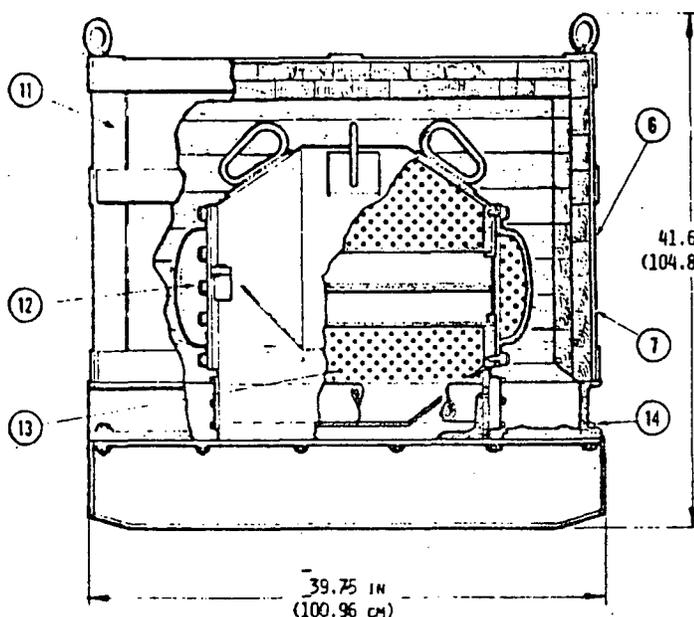
34.75 IN  
(88.26 CM)



NOTES

1. AECB CERTIFICATE CDN/2009/B(U)
2. CONFORMS IN ALL RESPECTS TO IAEA TYPE B(U) PACKAGING AS SPECIFIED IN "REGULATIONS FOR THE SAFE TRANSPORT OF RADIOACTIVE MATERIALS, 1973 EDITION, SAFETY SERIES NO. 6 AND AECL SPEC NO. D60086
3. LEAD SHIELDING 9 IN (22.9 CM)
4. FLOOR LOADING BASED ON PROJECTED FLOOR AREA 435 LB/SQ FT (0.21 KG/SQ CM).
5. APPROVED CONTENTS - 15,000 CURIES COBALT 60  
- 8,000 CURIES CESIUM 137
6. TOTAL WEIGHT - 3900 LBS (1770 KG).

41.68 IN  
(104.89 CM)



ATOMIC ENERGY OF CANADA LIMITED  
COMMERCIAL PRODUCTS  
P.O. BOX 6300 POSTAL STATION J OTTAWA  
K2A 3W3

TITLE		STANDARD ROUND DRAWER TRANSFER CASE WITH FIRESHIELD	
REF. DWG. TC-3-1 & D93-V-1	REVISED	5 MAY 1975	
DATE 11 JULY 1967	No.	F-147	REV. D
DRAWN	CHECKED		
SHEET 1 OF 1			

THIS DRAWING IS THE PROPERTY OF ATOMIC ENERGY OF CANADA LIMITED, AND IS SUBMITTED FOR CONSIDERATION ON THE UNDERSTANDING THAT THERE SHALL BE NO EXPLOITATION OF ANY INFORMATION CONTAINED HEREIN EXCEPT WITH THE SPECIFIC WRITTEN AGREEMENT OF ATOMIC ENERGY OF CANADA LIMITED.

1. Check that any required drawer end blocks are in place.
2. Check that the neoprene gaskets on the doors of the containers are in good condition.
3. Torque all door closure bolts to 80 ft lb (11 kg m).

NOTE:

HIGH TENSILE BOLTS (180,000 psi) MUST BE USED FOR ALL DOOR CLOSURE BOLTS.

4. Apply wire-lead seal through the holes in the heads of at least two of the door closure bolts or through each door latch.
5. Install fireshield and fasten all fireshield bolts. Torque all bolts to 30 ft lb (4.2 kg m). Use SAE Grade 2 bolts, minimum tensile strength 74,000 psi or better.
6. Reference Drawings:

F-131	-	A05818	F-147	-	TC-3-1, D93-V-1
F-143	-	TC-1-1, TC-1-38	F-158	-	A06414

<b>ATOMIC ENERGY OF CANADA LIMITED</b> COMMERCIAL PRODUCTS P.O. BOX 6300, Postal Station J, OTTAWA, CANADA. K2A 3W3	<b>TITLE</b> PREPARATION FOR SHIPMENT F-131, F-143, F-147 AND F-158 CONTAINERS			
	<b>REF. DWG.</b> See Item 6	<b>REVISED</b>		
THIS DRAWING IS THE PROPERTY OF ATOMIC ENERGY OF CANADA LIMITED, AND IS SUBMITTED FOR CONSIDERATION ON THE UNDERSTANDING THAT THERE SHALL BE NO EXPLOITATION OF ANY INFORMATION CONTAINED HEREIN EXCEPT WITH THE SPECIFIC WRITTEN AGREEMENT OF ATOMIC ENERGY OF CANADA LIMITED.	<b>DATE</b> June 1978	<b>No.</b> DS-0486	<b>REV</b>	
	<b>DRAWN</b> <i>T.L.M.</i>	<b>CHECKED</b> <i>[Signature]</i>	<b>APPROVED</b> <i>J.K.</i>	<b>SHEET</b> 1 OF 1
				[Initials]



DEPARTMENT OF TRANSPORTATION  
RESEARCH AND SPECIAL PROGRAMS ADMINISTRATION  
WASHINGTON, D.C. 20590  
IAEA CERTIFICATE OF COMPETENT AUTHORITY

Type B Radioactive Material Package Design

REFER TO:

Certificate Number USA/6125/B(U)

(Revalidation of Canadian Certificate CDN/2013/B(U)T, Rev. 0)  
(Revision 1)

RECEIVED

JUN 8 1978

E. DILLINGHAM, INC.  
U. S. CUSTOM HOUSE BLDG.  
OGDENSBURG, NEW YORK 13626

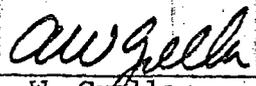
This establishes that the packaging design described herein, when loaded with the authorized radioactive contents, has been certified on February 1976, by the National Competent Authority of Canada (Appendix A) as meeting the regulatory requirements for Type B packaging for radioactive materials as prescribed in IAEA Regulations and constitutes a revalidation of that certificate in accordance with §§ 49 CFR 173.393b, 173.394(c) (3) and 173.395(c) (3) of the USA Regulations for the transport of radioactive materials.

- I. Package Identification - AECL Gammacell 220.
- II. Packaging Description - Packaging authorized by this certificate consists of a lead-shielded, thermally insulated steel body within a plywood shipping case 67" by 62" by 42" weighing approximately 8,500 pounds.
- III. Authorized Radioactive Contents - The authorized contents consist of not more than 26,000 curies of cobalt-60 doubly encapsulated in stainless steel or aluminum and stainless steel.
- IV. General Conditions -
  - a. Each user of this certificate must have in his possession a copy of this certificate.
  - b. Each user of this certificate, other than Atomic Energy of Canada Ltd, Ottawa, Canada, shall register his identity in writing to the Office of Hazardous Materials Regulations, U. S. Department of Transportation, Washington, D. C. 20590.
  - c. This certificate does not relieve any consignor or carrier from compliance with any requirement of the Government of any country through or into which the package is to be transported.
- V. Marking and Labeling - In addition to the marking prescribed in Canadian Certificate CDN/2013/B(U)T, the package must also bear the marking USA/6125/B(U), as well as the other marking and labels prescribed by the USA Regulations.
- VI. Expiration Date - This certificate, unless renewed, expires on March 30, 1979.

This certificate is issued in accordance with the requirements of the IAEA and USA Regulations and in response to the February 24, 1975 petition by Atomic Energy of Canada, Ltd, Ottawa, Canada, and in consideration of the associated information provided in Canadian Certificate CDN/2013/B(U), Rev. 0. (Appendix A).

Revision 1 issued in response to the May 3, 1978 petition by G. E. Dillingham, Ogdensburg, N. Y.

Certified by:

  
A. W. Grella  
Chief, R & D Management Division  
Office of Program Support  
Materials Transportation Bureau

June 1, 1978  
(DATE)

<sup>1</sup>"Safety Series No. 6, Regulations for the Safe Transport of Radioactive Materials," 1967 Edition published by the International Atomic Energy Agency (IAEA), Vienna, Austria.

<sup>2</sup>Title 49, Code of Federal Regulations, Parts 100-199, USA.

This certificate supersedes in its entirety, DOT Special Permit 6125.

Revision 1 issued to incorporate Canadian Certificate CDN/2013/B(U)T and to extend expiration date.

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3 February 1976

P.O. Box 1046 C.P. 1046  
Ottawa, Canada Ottawa, Canada  
K1P 5S9 K1P 5S9

**RADIOACTIVE MATERIAL TYPE B(U) PACKAGE DESIGN AND SHIPMENT  
CERTIFICATE CDN/2013/B(U)T REVISION 0**

This certifies that the packaging, as described, when loaded with the authorized radioactive contents and prepared for shipment in accordance with the instructions described below, has been demonstrated to meet the regulatory requirements prescribed for Type B(U) packages and shipment as described in IAEA (1) and Canadian regulations (2) (3) (4) (5) as appropriate, for the transportation of radioactive material.

Each shipper under this authorization, other than the original applicant, shall register his identity with the Atomic Energy Control Board prior to his first use of this authorization and shall certify that he possesses the necessary instructions for preparation of the package for shipment.

This Certificate does not relieve the shipper and carrier from compliance with any requirement of the government of any country through or into which the package will be transported.

**PACKAGING DESCRIPTION**

Gammacell 220 Irradiator prepared for shipment as illustrated on Atomic Energy of Canada Limited, Commercial Products, drawing A01885, (latest AECB approved revision) having a lead-shielded 760 mm diameter steel-encased body, which with the capsule assemblies is the containment system, completely wrapped in thermal insulation within a partial sheet metal cabinet, within a plywood shipping case. The plywood case has external dimensions of 1700 mm high by 1070 mm wide by 1560 mm long, and a total weight of 3800 kg. This package shall bear the competent authority identification mark "CDN/2013/B(U)".

**AUTHORIZED RADIOACTIVE CONTENTS**

Not more than 26,000 curies of  $^{60}\text{Co}$  in the form of metal pellets or slugs. Pellets and unsheathed slugs are doubly encapsulated in C198 stainless steel capsule assemblies. The aluminum-sheathed slugs are singly encapsulated in C185 stainless steel capsule assemblies. All capsules are mounted in a cylindrical source cage. The decay heat output for this material is not greater than 350 W. Maximum surface heat flux is 32 W/m<sup>2</sup>.

SHIPMENT

For the purposes of design the ambient temperature has been assumed as 38°C and the insolation as stated in Table III of (1).

The package shall be prepared for shipment in accordance with the approved procedures on the above-noted file and shall be further prepared for shipment and shipped and carried in accordance with the most recent Canadian Regulations for road (2), rail (3) marine (4) and air (5) transport and with the international regulations (1). Stowage instructions regarding heat removal shall be provided by the shipper. This certificate authorizes shipment by road, rail, marine and air transport. (Cargo aircraft only)

This Certificate is issued in accordance with the IAEA Regulations (1), the Atomic Energy Control Regulations (2), and by agreement with Canadian transportation regulatory authorities.

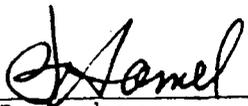
EXPIRY DATE

This certificate expires 30 March 1979.

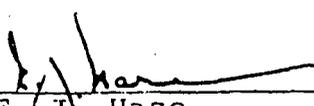
Certified by:

5

Endorsed by:



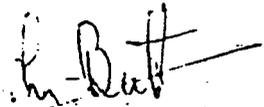
*for*  
J. H. Jennekens  
Director - Directorate of Licensing  
Atomic Energy Control Board  
P.O. Box 1046  
Ottawa, CANADA  
(Acting competent authority for  
road transport)



E. J. Hase  
Director of Operation  
Railway Transport Committee  
Canadian Transport Commission  
Ottawa, CANADA



R. L. Bolduc, Director  
Director, Aeronautical Licensing  
and Inspection Branch,  
Civil Aviation Branch  
Department of Transport  
Ottawa, CANADA



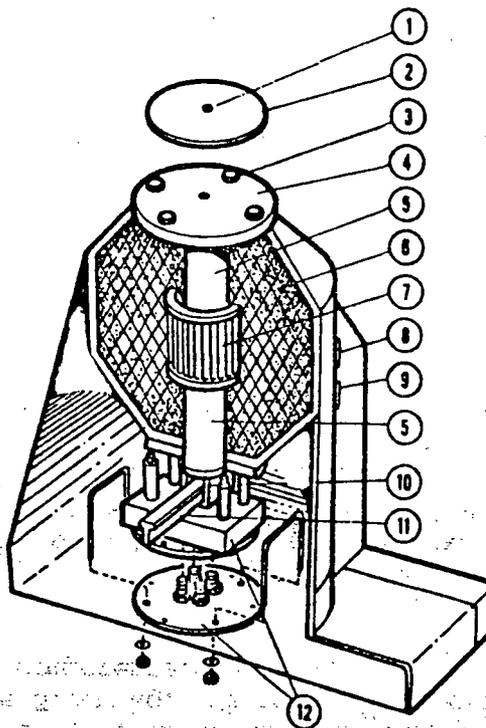
G. W. Graves - Chairman  
Board of Steamship Inspection  
Marine Regulations Branch  
Ministry of Transport  
Ottawa, CANADA

REFERENCES

- (1) IAEA "Regulations for the Safe Transport of Radioactive Materials" 1973 Edition Safety Series No. 6, International Atomic Energy Agency, Vienna STI/PUB/323.
- (2) Atomic Energy Control Regulations, SOR/74-334 dated 4 June 1974.
- (3) Regulations for the Transportation of Dangerous Commodities by Rail, as issued by the Canadian Transport Commission.
- (4) IMCO "International Dangerous Goods Code" published by the Inter-Governmental Maritime Consultative Organization, London. Authorized under Canada Shipping Act, Dangerous Goods Shipping Regulations SOR/73-327 d 14 June 1973. Refer also to National Harbours Board and St. Lawrence Seaway Authority regulations as appropriate.
- (5) IATA "Restricted Articles Regulations". Radioactive materials packaged and shipped in accordance with Part 2 of these regulations are deemed to meet the requirements of Sec 800 of the Air Regulations for Canada. See Flight Information Manual 1975 (T53-5/1975).

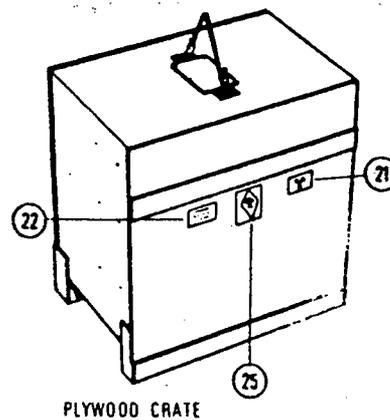
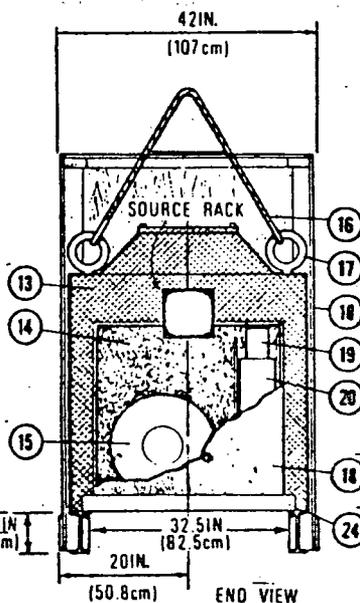
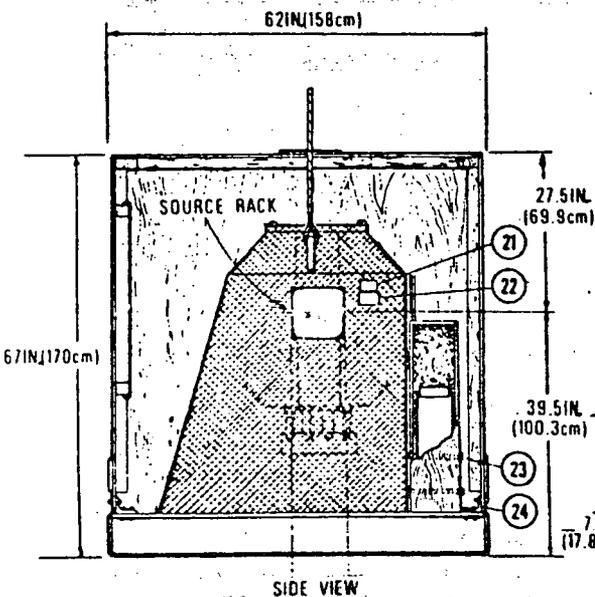
PACKAGE DESCRIPTION

1. 5/8 IN. x 16 BOLT (1)
2. 0.5 IN. (1.27 CM) THICK LEAD SHIELDING PLATE
3. 3/4 IN.-10 x 2-1/2 IN. LG SOCKET HEAD SCREWS (4)
4. SHIPPING COVER - STEEL PLATE 1 IN. (2.54 CM) THICK
5. LOWER DRAWER
6. LEAD SHIELDING
7. STAINLESS STEEL SOURCE RACK 8.8 IN DIA (22.3 CM) x 3.3 IN. (21 CM) WITH STAINLESS STEEL WELDED CAPSULES CONTAINING COBALT 60
8. RADIATION CAUTION PLATE WITH SPECIFIED CONTENT (1) - AECL CP SPEC DG0095
9. AECL CERTIFICATION PLATE (1) - AECL CP SPEC DG0097
10. DRAWER BOTTOM BRACKET
11. T-ELEVATING BAR
12. SHIPPING BRACKET ASSEMBLY
13. KADMOOL - 0.5 IN. (1.27 CM) THICK. POLYETHYLENE (4 MIL) WIRE MESH 1 IN. (2.54 CM). STANDARD STEEL PACKING STRAPS 1/2 IN. (1.27 CM) WIDE. AECL CP SPEC P0121
14. PACKING MATERIAL
15. SHIELD COLLAR (END USE ONLY)
16. HOIST SLING
17. SHOULDER EYELET (2)
18. 0.5 IN. (1.27 CM) THICK PLYWOOD CRATE
19. SHIELDING PLUG (END USE ONLY)
20. UPPER DRAWER (END USE ONLY)
21. RADIATION CAUTION PLATE (2) - AECL CP SPEC DG0096
22. AECL CERTIFICATION PLATE (2) - AECL CP SPEC DG0097
23. 1/2 IN.-13 x 9 IN LG SQ HD BOLTS (3)
24. SHIPPING BRACKET (2) WITH 5/8 IN.-11 x 1-1/4 IN. LG HEX HD SCREWS (8)
25. CATEGORY III LABEL (2) - AECL CP SPEC DG0102



NOTES

I.A.E.A. - TYPE B(u)      CAPACITY - 26,000 Ci. <sup>60</sup>Co  
 GROSS WEIGHT 3500 LB (3856 KG)      AECL CERT. C011/2013/B(U)T  
 PROJECTED FLOOR LOADING 468 LB/SQ FT (0.23 KG/SQ CM)  
 FLOOR AREA 18.2 SQ FT (APPROX)  
 16.910 SQ CM (APPROX)



ATOMIC ENERGY OF CANADA LIMITED  
 COMMERCIAL PRODUCTS

P.O. BOX 6300, Postal Station J, OTTAWA, CANADA. K2A 3W3

THIS DRAWING IS THE PROPERTY OF ATOMIC ENERGY OF CANADA LIMITED, AND IS SUBMITTED FOR CONSIDERATION ON THE UNDERSTANDING THAT THERE SHALL BE NO EXPLOITATION OF ANY INFORMATION CONTAINED HEREIN EXCEPT WITH THE SPECIFIC WRITTEN AGREEMENT OF ATOMIC ENERGY OF CANADA LIMITED.

TITLE  
**GAMMACELL 220  
 "LIVE" SOURCE HEAD  
 CRATING FOR SHIPMENT**

REF. DWG.	A01885	REVISED	JUNE 12, 1975
DATE	31 JANUARY 1975	No.	DS-0284
DRAWN	CHECKED	APPROVED	REV.
LB	167	AK	A
SHEET			99530

~~OMIT~~  
 KEYWORD INDEX  
 LABELLING  
 GAMMACELL 220

APPLICABLE DOCUMENTS

Spec DG0086 Mandatory Labelling Procedures - Product Licensing, General Directive.

Item 1 "Caution" with curie content label (1 off) Spec DG0095, drawing A00511, shall be mounted, adjacent to item 2, on right side of sheet metal superstructure (facing the front of the unit). The label shall be positioned approximately 1 ft above the platform and mounted with machine screws, round head, Phillips, steel, cadmium plated, #8 x 32 x 1/4 in.

Item 2 "A.E.C.B." shipping label (1 off) - replaces B.T.C. version, Spec DG0097, drawing A01828, shall be mounted, adjacent to item 1, on right side of sheet metal superstructure (facing the front of the unit). The label shall be positioned approximately 1 ft above the platform and mounted with machine screws of the type and size specified in item 1.

Item 3 "Caution" shipping labels (2 off) Spec DG0096, drawing A03621 - the labels shall be attached, adjacent to item 4, to wire mesh on two opposite sides on the thermal insulation package. The labels shall be secured on four corners with suitable soft iron wire.

Item 4 "A.E.C.B." shipping label (2 off) - replaces B.T.C. version, Spec DG0097, drawing A01828 - the labels shall be attached, adjacent to item 3, to wire mesh on two opposite sides on the thermal insulation package. The labels shall be secured on four corners with suitable soft iron wire.

Item 5 "Caution" shipping labels (2 off) Spec DG0096, drawing A03621 - the labels shall be mounted, adjacent to item 6, on two opposite sides of the outer packaging, crating, or fire shield. Wood screws, round head, steel, cadmium plated #8 x 1/2 in shall be used to mount the labels. Spec DG0103 indicates approximate location.

Item 6 "A.E.C.B." shipping labels (2 off) - replaces B.T.C. version, Spec DG0097, drawing A01828 - the labels shall be mounted, adjacent to item 5, on two opposite sides of the outer packaging, crating, or fire shield. Wood screws, round head, steel, cadmium plated #8 x 1/2 in shall be used to mount the labels.

<b>ATOMIC ENERGY OF CANADA LIMITED</b> COMMERCIAL PRODUCTS P.O. BOX 6300, Postal Station J, OTTAWA, CANADA.	<b>TITLE</b> MANDATORY LABELLING - GAMMACELL 220												
THIS DRAWING IS THE PROPERTY OF ATOMIC ENERGY OF CANADA LIMITED, AND IS SUBMITTED FOR CONSIDERATION ON THE UNDERSTANDING THAT THERE SHALL BE NO REPRODUCTION OF ANY INFORMATION CONTAINED HEREIN EXCEPT WITH THE SPECIFIC WRITTEN AGREEMENT OF ATOMIC ENERGY OF CANADA LIMITED.	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;"><b>REF. DWG.</b></td> <td style="width: 25%;"><b>REVISED</b></td> <td style="width: 25%;"></td> <td style="width: 25%;"></td> </tr> <tr> <td>DATE November 8, 1968</td> <td>No.</td> <td></td> <td>RE</td> </tr> <tr> <td><b>DRAWN</b> D.X.L.</td> <td><b>CHECKED</b> E.H.K.</td> <td><b>APPROVED</b> E.H.K.</td> <td>DS0115</td> </tr> </table>	<b>REF. DWG.</b>	<b>REVISED</b>			DATE November 8, 1968	No.		RE	<b>DRAWN</b> D.X.L.	<b>CHECKED</b> E.H.K.	<b>APPROVED</b> E.H.K.	DS0115
<b>REF. DWG.</b>	<b>REVISED</b>												
DATE November 8, 1968	No.		RE										
<b>DRAWN</b> D.X.L.	<b>CHECKED</b> E.H.K.	<b>APPROVED</b> E.H.K.	DS0115										

Item 7 "Category III" shipping labels (2 off) as per I.A.E.A. specification (A.E.C.L. Spec DG0102) - the labels shall be affixed on two opposite sides of the outer packaging, crating, or fire shield. The labels shall be centrally located on the applicable surface. Spec DG0103 indicates approximate location.

Item 8 "Special Graphics (2 off each) related to unit specifications i.e., high centre of gravity, international wine glass symbol, crate no., crate dimensions (overall length, width, height), gross weight and floor loading, unit model, serial no., hoist cable configuration etc., displayed in black on two opposite sides of the outer packaging, crating, or fire shield. Spec DG0103 indicates approximate location.

Item 9 "C.S.A." two piece certification label (1 off), Spec DG0098, drawing A01829, shall be affixed to rear sheet metal enclosure.

<b>ATOMIC ENERGY OF CANADA LIMITED</b> COMMERCIAL PRODUCTS P.O. BOX 6300 Postal Station J, OTTAWA, CANADA.		<b>TITLE</b> MANDATORY LABELLING - GAMMACELL 220	
<small>THIS DRAWING IS THE PROPERTY OF ATOMIC ENERGY OF CANADA LIMITED, AND IS SUBMITTED FOR CONSIDERATION ON THE UNDERSTANDING THAT THERE SHALL BE NO EXPLOITATION OF ANY INFORMATION CONTAINED HEREIN EXCEPT WITH THE SPECIFIC WRITTEN AGREEMENT OF ATOMIC ENERGY OF CANADA LIMITED.</small>		<b>REF. DWG.</b> DATE November 8, 1968	<b>REVISED</b> No. DS011500030
<b>DRAWN</b> <i>L.K.G.</i>	<b>CHECKED</b> <i>EA</i>	<b>APPROVED</b> <i>EA</i>	<b>REV.</b>
<b>SHEET</b> 2 OF 2			



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

REPLY TO  
ATTENTION OF:

APR 0 8 1986

HSHL-HP

SUBJECT: Renewal of U.S. Nuclear Regulatory Commission License  
No. 08-01738-03, Docket No. 030-06895, Control No. 104081

THRU: TSG HQDA (DASG-PSP-E)  
Washington, D.C. 20310

TO: U.S. Nuclear Regulatory Commission, Region 1  
Nuclear Materials Safety Section B  
Division of Radiation Safety and Safeguard  
631 Park Avenue  
King of Prussia, PA 19406

1. Reference: Letter, U.S. Nuclear Regulatory Commission Region 1 Nuclear Materials Safety Section B, Division of Radiation Safety and Safeguards, 631 Park Avenue, King of Prussia PA., 13 March 86, subject: as above.
2. MAJ Gerald M. Connock was appointed as Radiation Protection Officer for Walter Reed Army Medical Center (WRAMC) October 1985. An outline of his training and experience is attached as Enclosure 1.
3. The Radiation Control Committee duties, responsibilities and membership listed under Tab 7 of the application dated 18 July 79 for NRC License No. 08-01738-02 was revised by a letter of amendment date 13 January 84. A copy of the amended Tab 7, revised to list current membership, and provide a curriculum vitae for each member is attached as Enclosure 2.
4. Tab 8 of the above noted application has been revised. HSWP-QHP Memo Number 9, "Procedures For Obtaining Authorization to Use Radioactive Material" is replaced by WRAMC Regulation 40-10, "Medical Service - Health Physics," Chapter 3, "Authorization to Use Radioactive Material. A copy is attached as Enclosure 3. In order to provide the forms referenced in Enclosure 3, copies of the "Application for Authorization to Use Radioactive Material," WRAMC Form 1661-R-Human Use, WRAMC Form 1662-R-Non-Human Use, and WRAMC Form 1643, "Training and Experience of Authorized Users." are attached as Enclosure 4, 5 and 6 respectively.
5. An individual must meet the following criteria in order to take on the responsibilities and position of an authorized Principal User.

Information in this record was deleted  
in accordance with the Freedom of Information  
Act, exemptions 6  
FOIA 2006-0238

JV/2

HSHL-HP

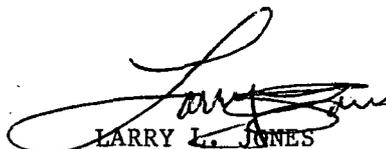
SUBJECT: Renewal of U.S. Nuclear Regulatory Commission License  
No. 08-01738-03, Docket No. 030-06895, Control No. 104081

a. The individuals organizational position should assure direct administrative control over the facilities, equipment, and personnel listed on the "Application for Authorization to Use Radioactive Material."

b. The qualifications, training and experience of each person should be commensurate with the material and its use as proposed in the application. The information provided by the applicant on WRAMC Form 1643, "Training and Experience of Authorized Radioisotope Users" is reviewed to assure competency to work without the presense of supervisory personnel.

FOR THE COMMANDER:

6 Encls  
as (6 copies)



LARRY L. JONES  
LTC, MS  
Adjutant General

CF:  
CDR, HSC  
ATTN: HSCL-P

CURRICULUM VITAE

for

GERALD M. CONNOCK, M.S.

Date & Place of Birth:

Home Address:

Home Telephone Number:

Office Address:

Health Physics Office  
Walter Reed Army Medical Center  
Washington, DC 20307-5001

Office Telephone Number:

(301) 427-5104

Degrees:

M.S. - Medical Physics [ ]  
University of California, Los Angeles  
Los Angeles, CA

B.A. - Anthropology [ ]  
University of Florida  
Gainesville, FL

Professional Societies:

Health Physics Society

Other Education and Training:

1980 - 1983

USA Command and General Staff Officer Course  
Non-resident

1982

Laser and Microwave Hazards Workshop  
US Army Environmental Hygiene Agency  
Aberdeen Proving Ground, MD

1981

US Army Medical X-Ray Survey Techniques  
Course  
Academy of Health Sciences, US Army  
Fort Sam Houston, TX

1981

AMEDD Radiation Protection Officers Workshop  
US Army Environmental Hygiene Agency  
Aberdeen Proving Ground, MD

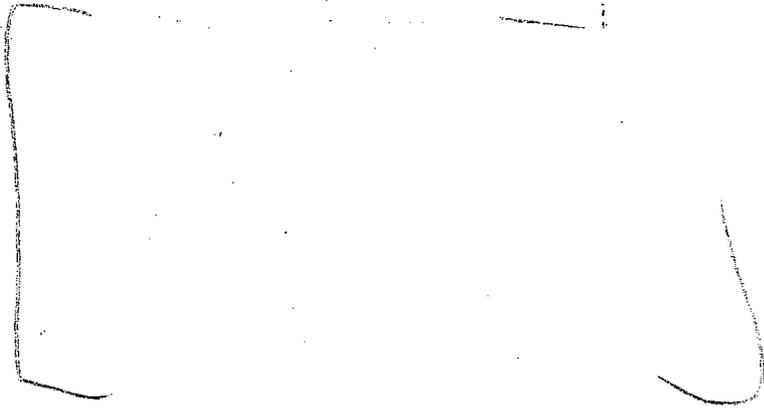
EX6

APR 22 1986

CURRICULUM VITAE

NAME: Keith Kellogg Hunt, Jr.                      DATE OF RANK: 3 June 1977  
RANK: Colonel, Medical Corps                      MOS: 60F  
SSN: [ ]                      MILITARY SERVICE: 1 July 1962 to present  
CURRENT ASSIGNMENT: Chief, Department of Medicine, Walter Reed Army Medical  
Center, Washington, DC 20012 (Telephone: 576-1205)  
BUSINESS ADDRESS: Box 300, Walter Reed Army Medical Center, Washington, DC 20012

DATE OF BIRTH:  
PLACE OF BIRTH:  
RELIGION:  
NAME OF SPOUSE:  
DATE MARRIED:  
CHILDREN:  
HOME ADDRESS:



PROFESSIONAL EDUCATION AND TRAINING

University of Virginia  
University of Virginia Medical School



BA, Psychology  
MD

Rotating Internship  
Tripler Army Medical Center  
Honolulu, Hawaii

Jul 1962 - Jun 1963

General Practice  
Walson Army Hospital  
Fort Dix, New Jersey

Sep 1965 - Aug 1966

Internal Medicine Residency  
Walter Reed Army Medical Center  
Washington, DC

Sep 1966 - Aug 1969

Pulmonary Fellowship  
Walter Reed Army Medical Center  
Washington, DC

Sep 1969 - Aug 1970

SPECIALTY CERTIFICATION:

American Board of Internal Medicine  
Diplomate in Subspecialty of Pulmonary Disease  
Recertification, American Board of Internal Medicine

23 October 1970  
17 October 1972  
29 October 1977

EX 6

CONNOCK, Gerald M. (Continuation of Curriculum Vitae)

1981 Nuclear Hazards Training Course  
Interservice Nuclear Weapons School  
Sandia Base, NM

1980 Medical Effects of Nuclear Weapons Course  
Armed Forces Radiobiology Research Institute  
Bethesda, MD

1977 AMEDD Officer Advanced Course  
Academy of Health Sciences, US Army  
Fort Sam Houston, TX

1972 Essential Medical Training for AMEDD Aviators  
Fort Sam Houston, TX

1972 Rotary Winged Officers Course  
Fort Rucker, AL

1971 Battalion Surgeons Assistance Course  
US Army Medical Field Service School  
Fort Sam Houston, TX

1971 AMEDD Officer Basic Course  
US Army Medical Field Service School  
Fort Sam Houston, TX

Chronological Experience:

Oct 1985 - Present

Walter Reed Army Medical Center  
Washington, DC 20307-5001  
Health Physics Officer  
Health Physics Office

Develop, direct and provide health physics services for WRAMC and its supported activities including USAMRIID, Ft. Detrick. Develop, review, and direct Health Physics Training programs. Organize, equip, train and direct the operations of the Radiological Advisory Medical Team. Serve as Executive Agent for the WRAMC Radiation Control Committee and for Nuclear Regulatory Licenses and DA Authorizations for the possession, storage, use and disposal of radioactive material at WRAMC and tenant activities. Provide interpretation and assure compliance with license conditions,

CONNOCK, Gerald M. (Continuation of Curriculum Vitae)

federal laws, Army Regulations, and National Standards pertaining to ionizing and non-ionizing radiation. Advise the Commander, WRAMC, as Radiation Protection Officer, on all other matters pertaining to ionizing and nonionizing radiation hazards.

Sep 1984 - Oct 1985

Walter Reed Army Medical Center  
Washington, DC 20307-5001  
Chief, Operations Branch  
Health Physics Office

Apr 1984 - Sep 1984

Walter Reed Army Medical Center  
Washington, DC 20307-5001  
Assistant Chief, Operations Branch  
Health Physics Office

Supervise personnel in conduct of radiation protection surveys for radioisotope laboratories, X-ray units, radiotherapy procedures, emergency response, and shielding evaluations. Provide classes for medical personnel in ionizing radiation protection.

Jul 1983 - Mar 1984

US Army Medical Department Activity Panama  
Ancon, Republic of Panama  
Alternate Radiation Protection Officer  
Health Physics Consultant

Assisted in the performance of radiation protection surveys for radioisotope laboratory, X-ray units, and emergency response. Assisted in the management and monitoring of a radiation film badge program. Provided advice on numerous radiation protection and procedural questions for medical staff and patients. Assisted in the preparation and submission of the renewal of the Department of the Army Radioactive Material Authorization.

Dec 1979 - Jul 1982

Academy of Health Sciences, US Army  
Combat Developments and Health Care Studies  
Directorate  
Fort Sam Houston, TX  
Nuclear Medical Science Officer

Provided professional consultation and prepared operational concepts for the Commandant and his staff, both medical and non-medical personnel, concerning ionizing and nonionizing

CONNOCK, Gerald M. (Continuation of Curriculum Vitae)

practices. Evaluated Department of the Army operational doctrine pertaining to medical operations in radiation environments, which affected the health of individuals and the environment within which AMEDD facilities and units operated. Further recommended concepts of operations for the employment of AMEDD units in ionizing and nonionizing radiation environments. Represented the command at numerous interservice and civilian meetings addressing ionizing and non-ionizing radiation protection.

Jan 1978 - Dec 1979

University of California, Los Angeles  
Medical Physics Division  
Student

Studied radiation protection, regulations, radiation biology, medical physics, radiopharmacology, nuclear medicine physics, and radiation therapy. Wrote a thesis dealing with Minimum Object Visibility on X-rays, a comparison between standard and high kilovoltage techniques. In addition, gave in-service physics training on imaging systems to nuclear medicine technologists.

Publications:

"Medical Operations in a Contaminated Environment," Symposium on Mission Accomplishment in an NBC Environment, American Defense Preparedness Association, 1980.

"Minimum Size Object Visibility on X-Rays Taken at 80 kVp and 240 kVp," UCLA, 1979 - (thesis).

DEPARTMENT OF THE ARMY  
 HEADQUARTERS WALTER REED ARMY MEDICAL CENTER  
 Washington, DC 20307

WRAMC Regulation  
 No. 15-4

17 NOV 1981

Boards, Commissions and Committees

PATIENT CARE COMMITTEES, BOARDS AND COUNCILS,  
 WALTER REED ARMY MEDICAL CENTER

\* \* \*

\* \* \*

CHAPTER 2  
 Committees

\* \* \*

\* \* \*

2-18 Radiation Control Committee

a. Composition

Deputy Commander (Chairperson)  
 C, Department of Medicine  
 C, Department of Nursing  
 C, Department of Pathology/Area Lab Services  
 C, Department of Radiology  
 C, Radiation Oncology Services  
 C, Nuclear Medicine Service  
 Health Physics Officer (RPO)  
 Senior Nuclear Pharmacist  
 Assistant Health Physics Officer (Alternate RPO) (Recorder)  
 D, WRAIR  
 Radiation Safety Officer, WRAIR  
 Radiation Protection Officer, AFIP  
 Scientific Advisor, USAMRIID

b. Purpose: To formulate rules and procedures for the safe use of sources of ionizing and nonionizing radiation; to assure compliance with the regulations and standards of the Nuclear Regulatory Commission, the Office of the Surgeon General, Department of the Army and other regulatory agencies; and to conduct a continuing review of the administrative control procedures.

c. Responsibilities:

- (1) Perform those functions specified in AR 40-14, AR 40-37 & 385-11.
- (2) Review and approve local procedures for the receipt, use, transport, storage and disposal of radioactive materials.

(3) Review and approve procedures to guide nursing and other personnel who are in contact with patients receiving therapeutic amounts of radio-nuclides; rules relating to the discharge of such patients; and rules to protect personnel involved when such patients undergo surgical procedures or autopsy.

(4) Establish such standing or ad hoc subcommittees as may be necessary to perform its functions.

d. Minutes: The minutes shall be prepared in triplicate, the original and one copy to be forwarded to the Executive Committee for approval NLT five (5) working days after the meeting. That copy will become a part of the Executive Committee minutes and the original will be returned to the committee recorder for action and to be placed in the Radiation Control Committee's files. The minutes are also included in the "Radioisotopes in Human Use Activities" report, RCS MED-197.

e. Office of Record - Health Physics

f. Frequency - Quarterly or at the call of the Chairperson

g. References:

(1) AR 40-14 (Control and Recording Procedures for Occupational Exposure to Ionizing Radiation).

(2) HSC 40-1

\* \* \*

\* \* \*

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

HSHL-HP  
MEMO Number 4

19 July 1983

ORGANIZATION AND FUNCTION  
OF THE  
RADIATION CONTROL COMMITTEE SUBCOMMITTEES

1. REFERENCES

- a. Title 10, Chapter 1, Code of Federal Regulations, "Energy - U.S. Nuclear Regulatory Commission Rules and Regulations."
- b. WRAMC US NRC License 08-0738-02.
- c. WRAMC Regulation 15-4, "Health Care Committees."
- d. WRAMC Regulation 40-10, "Health Physics."

2. DISCUSSION

Reference a. above stipulates that no individual may receive, acquire, own, possess, use, or transfer radioactive material unless authorized by the Nuclear Regulatory Commission (NRC) via a Specific NRC License. At present, WRAMC possesses a "Specific NRC License of Broad Scope for By-Product Material" that allows WRAMC to utilize certain types and quantities of radioactive material for the purpose specified therein. One of the NRC requirements for possession of the current license stipulates that WRAMC must establish a radiation safety committee that exercises administrative control over the safe use of radioactive materials. In order to fulfill this requirement, WRAMC has established the Radiation Control Committee (RCC) with responsibility and authority for assuring the safe use of ionizing radiation at WRAMC and certain tenant activities. The primary method used by the WRAMC RCC to fulfill its responsibilities for administrative supervision of licensed radioactive materials is via the review process associated with WRAMC Radioactive Material Authorizations applications. RCC safety evaluations of the proposed uses of radioactive material, which take into consideration such matters as the adequacy of facilities and equipment, training and experience of the user, and the operating or handling procedures, are necessary in order for the RCC to accomplish its function and mandatory if WRAMC desires to possess a NRC License for radioactive material.

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CONTENTS OF THIS MEMO WERE APPROVED BY THE WRAMC RADIATION CONTROL COMMITTEE  
ON 2 JUNE 1983

## MEMO Number 4 (Organization and Function of the Radiation Control Committee Subcommittee)

## 3. SUBCOMMITTEE PURPOSES, FUNCTIONS AND ORGANIZATION

## a. Standing Subcommittee are as follows:

- (1) Subcommittee for Human Use of Ionizing Radiation (Annex A)

## b. Special Subcommittees

Special subcommittees are appointed by the Radiation Control Committee as required.

## c. Membership on Subcommittee

- (1) Determined by areas of special competence or training as required by purpose for subcommittee.
- (2) Individual are nominated and approved by the Radiation Control Committee at its quarterly meeting. Individuals nominated and approved need not be members of the Radiation Control Committee.

## d. Chairperson of Subcommittee

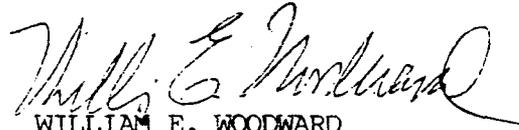
- (1) Should be a member of the Radiation Control Committee.
- (2) Appointed by the Chairperson, Radiation Control Committee.

## e. Meetings of Subcommittees

- (1) Time/Frequency: As required.
- (2) Quorum: Consists of more than 50% of the designated members of of the subcommittee.
- (3) Voting: All designated members of the subcommittee will vote on issues brought before the subcommittee requiring actions. Members with a vested interest in a particular issue will disqualify themselves from voting on that issue.
- (4) Reports: At quarterly Radiation Control Committee Meeting.

4. RADIATION MATERIAL AUTHORIZATIONS

The Radioactive Material Authorization Application review process is outlined in Annex B.



WILLIAM E. WOODWARD  
LTC, MSC  
Health Physics Officer

ANNEXES

- A - Subcommittee for Human Use of Ionizing Radiation
- B - WRAMC Regulation 40-10, "Health Physics," Chapter 3, "Authorization to Use Radioactive Material."

ANNEX A

SUBCOMMITTEE FOR THE HUMAN USE OF IONIZING RADIATION

1. PURPOSE

a. To review proposals/requests for the human use of ionizing radiation and to recommend approval/disapproval.

b. To give interim approval/disapproval on requests for the human use of ionizing radiation and make recommendations to the RCC.

c. To Consider, make recommendations on, act on all other matters referred to it by the Radiation Control Committee.

2. MEMBERSHIP. The subcommittee for Human Use of Ionizing Radiation shall consist of at least the following six (6) individuals:

a. A person with special competence in health physics and radiation safety.

b. A physician recognized as a specialist in radiation therapy.

c. A physician recognized as a specialist in nuclear medicine.

d. A person qualified by training and experience to formulate radioactive drugs.

e. A physician with special competence in internal medicine or hematology.

f. A representative of the Judge Advocate's Office.

Additional members may be appointed to the subcommittee in order to achieve sufficient diversity in the membership. These members shall be qualified in various disciplines pertinent to the field of human use of ionizing radiation (e. g. radiation biology, radiation physics, clinical pathology, radiology and endocrinology).

## ANNEX B

## CHAPTER 3

## Authorization to Use Radioactive Material

## 3-1. General.

a. The NRC has issued a specific "License of Broad Scope for By-Product Material" to WRAMC allowing use of specific types and quantities of radioactive material. NRC requirements stipulate that a Radiation Control Committee be established to exercise administrative control over the safe use of radioactive materials. The WRAMC RCC was chartered to meet these requirements.

b. The RCC issues Radioactive Material Authorizations to Principal Users as a means of controlling the use of radioactive material. All users of radioactive material must receive their authorization prior to using the material.

c. Non-Human Use Radioactive Material Authorizations are issued for 3 years. Human Use Authorizations are issued for 1 year. Both types of authorizations may be renewed upon request.

d. Individuals possessing more than 1/2 pound of pure natural uranium compounds are required to obtain an authorization.

## 3-2. Application Procedure.

a. To obtain, amend, renew or terminate authorization for use of radioactive material, individuals must submit "Application to Use Radioactive Materials," WRAMC Form 1661-R-Human Use or WRAMC Form 1662-R-Non Human Use. Applications will be submitted to the HPO for review and approval. All applications for human use of radioisotopes must be submitted to the Human Use Subcommittee for review of physician training and experience before HPO review. Each Principal User and Co-Worker must submit WRAMC Form 1643, "Training and Experience of Authorized Radioisotope Users", with the application. Each physician listed on a Human Use Authorization is required to submit NRC Form 313-M, Supplement B, Preceptor Statement, with the application.

b. Protocols describing the use and accountability of Tritiated Thymidine, Phosphorous-32 and unbound Iodine from the time of receipt until the time of disposal will be submitted with the application. The HPO may require protocols for other radioisotopes.

c. All requested information on the application will be provided. Incomplete applications will be returned, causing a delay in approval.

d. Application for use of gamma cell irradiators must include a copy of the proposed SOP addressing personnel safety, routine operation and emergency provisions.

WRAMC RADIATION CONTROL COMMITTEE MEMBERSHIP

<u>TITLE</u>	<u>MEMBER/SIGNATURE</u>
DEPUTY COMMANDER (Chairperson) (576-1394/5)	RUMBAUGH, James H., COL, MC
CHIEF, DEPARTMENT OF MEDICINE (Member) (576-1205)	HUNT, Keith K., Jr., COL, MC
CHIEF, DEPARTMENT OF NURSING (Member) (576-1870)	ADAMS-ENDER, Clara L., COL, ANC
CHIEF, DEPARTMENT OF PATHOLOGY (Member) (576-1280)	CLARK, Gary B., COL, MC
CHIEF, DEPARTMENT OF RADIOLOGY (Member) (576-1930)	HAGAN, Raoul, COL, MC
CHIEF, RADIATION ONCOLOGY SERVICE (Member) (576-1180)	MC NAB, James F., MAJ, MC
CHIEF, NUCLEAR MEDICINE SERVICE (Member) (576-0168)	VAN NOSTRAND, Douglas, LTC, MC
HEALTH PHYSICS OFFICER (Member) (427-5161)	CONNOCK, Gerald M., MAJ, MS
SENIOR NUCLEAR PHARMACIST (Member) (576-0177)	STOOPS, Howard, CPT, MS
ASSISTANT HEALTH PHYSICS OFFICER (Recorder) (427-5104)	HINTENLANG, David E., CPT, MS
DIRECTOR, WRAIR (Member) (576-3551/2/87/3607)	TOP, Franklin H., Jr., COL, MC
RADIATION SAFETY OFFICER, WRAIR (Member) (576-3428)	BASS, Billy G., DAC
RADIATION PROTECTION OFFICER, AFIP (Member) (576-2973)	MC CARTHY, Michael J., LTC, USAF, MC
RADIATION PROTECTION OFFICER, USAMRIID (Member) (393-1839 X7373)	KUEHNE, Ralph, MS, DAC
ASSISTANT HEALTH PHYSICS OFFICER (ALTERNATE RPO) (427-5107)	STAFFORD, James E., DAC

CURRICULUM VITAE  
FOR  
JAMES H. RUMBAUGH, MD

PERSONAL DATA:

Born: [ ]

Family: [ ]

Rank: Colonel, US Army

Date of Rank: 12 June 1979

EDUCATIONAL BACKGROUND:

Elementary and High School: Numerous elementary and high schools (military dependent), graduated from Corry High School, Corry, PA [ ]

Undergraduate School: Thiel College, Greenville, PA, [ ] BA History  
Varsity letters in four sports, President of Student Body, Who's Who in American Colleges and Universities

Medical School: Thomas Jefferson University, College of Medicine, Philadelphia, PA, M.D., [ ] President of Sophomore, Junior and Senior Classes

INTERNSHIP:

US Army, Walter Reed General Hospital 1964-65

RESIDENCY:

US Army, Walter Reed General Hospital, Adult Psychiatry 1965-68  
Diplomate, Washington School of Psychiatry in Group Psychotherapy 1966-68  
US Army, Walter Reed General Hospital, Child Psychiatry 1972-74

BOARD CERTIFICATION:

American Board of Psychiatry and Neurology (Psychiatry), 1972  
Board Eligible, Child Psychiatry, 1974  
National Board of Medical Examiners, 1965

STATE LICENSURE:

Hawaii #MD-02140  
Maryland D 17555  
Virginia 010-028160

EX6

ASSIGNMENTS/POSITIONS HELD:

Chief Resident, Psychiatry Outpatient Clinic, Walter Reed General Hospital 1968  
Division Psychiatrist, 1st Cavalry Division, Republic of Vietnam 1968-69  
Division Surgeon, 9th Infantry Division, Republic of Vietnam 1969  
Chief, Mental Health Community Service, Schofield Barracks, Hawaii 1969-70  
Asst Chief, Psychiatry Service, Tripler Army Hospital, Hawaii 1970-71  
Consultant for Drug & Alcohol Programs for US Army Hawaii & US Army Pacific 1971-72  
Clinical Instructor in Psychiatry, University of Hawaii Medical School 1970-72  
Resident, Child Psychiatry, Walter Reed Army Medical Center 1972-74  
Director, Community Mental Health and Military Psychiatry Training, Walter Reed Army Medical Center 1974-77  
Chief, Alcoholism and Drug Service, Walter Reed Army Medical Center 1975-77  
Psychiatry & Neurology Consultant to The Surgeon General 1977-78  
Chief, Medical Corps Career Activities Office (Worldwide assignment and career management of over 5,000 US Army physicians & physician assistants) 1978-82  
US Army War College 1982-83  
Commander, Womack Army Community Hospital/XVIII Airborne Corps Surgeon, Ft Bragg, NC 1983-85  
Deputy Commander for Clinical Services, Walter Reed Army Medical Center 1985-Present

APPOINTMENTS:

Member of National Advisory Council on Aging, National Institutes of Health 1977-82  
Special Advisor to the White House Conference on Aging 1981  
Medical School Admissions Committee Member, Uniformed Services University of the Health Sciences, Bethesda, MD 1978-81  
Board Examiner, American Board of Psychiatry and Neurology 1978-81  
APA Committee on Federal Government Health Services 1978-79

PROFESSIONAL ORGANIZATIONS:

Association of Military Surgeons of the United States  
Washington Psychiatric Society, Washington, DC  
Society of Medical Consultants to the Armed Forces  
American Psychiatry Association  
American Academy of Medical Directors

AWARDS & DECORATIONS:

Expert Field Medical Badge  
US & Egyptian Parachutist Badges  
Bronze Star Medal  
Meritorious Service Medal  
Army Commendation Medal  
National Defense Service Medal  
Armed Forces Reserve Medal  
Republic of Vietnam Campaign Ribbon  
Vietnam Service Medal  
Overseas Medal  
"A" Professional Designator in Psychiatry  
Legion of Merit

PUBLICATIONS:

H. Holloway, F. Jones, N. Camp, H. Silsby, J. Rumbaugh, A. Johnson; "Vietnam Military Psychiatry Revisited," Symposium on Contemporary Issues in Military Psychiatry. Syllabus and Scientific Proceedings, 135th Annual Meeting, American Psychiatric Association, 1982.

J. Rumbaugh, S. Xenakis, R. Hales; Educating "Military Psychiatrists in the Community," Symposium on Military Psychiatry in 1980. Syllabus and Scientific Proceedings, 134th Annual Meeting, American Psychiatric Association, 1981.

P. Ellsworth & J. Rumbaugh, "Community Organization and Planning Consultations: Strategies for Community-Wide Assessment and Preventive Program Design, Occupational Therapy in Mental Health, 1980, Vol. 1, No. 1, Haworth Press, Fifth Ave, NY, NY.

J. Rumbaugh, Family Life Program, US Army Hawaii Publication, Honolulu, HI, 1972.

RESEARCH:

Assisted in research design and implementation of experimental operant ward at Walter Reed Army Medical Center for dysfunctional soldiers; participation cited in: Boren, J. J. and Colman, A. D., "Some Experiments on Reinforcement Privileges Within a Psychiatric Ward for Delinquent Soldiers," Journal of Applied Behaviour Analysis, 1970, Vol. 3, pp 29-37. "The Rumbaugh Run."

Co-researcher with Dr. Edwin Weinstein, Mt. Sinai Hospital, NY, NY, "Language Patterns and Symbolism in Conversion Hysteria" in writing for publication.

MISCELLANEOUS:

Presented panels and discussed papers at national meetings in areas relating to child, family, community and military mental health issues:

American Association Psychiatric Services for Children, New York, 1973-74

American Psychiatric Association Meeting, Detroit, 1974

American Association Psychiatric Services for Children, Chicago, 1973

Orthopsychiatry, Atlanta, 1975

American Psychiatric Association National Meetings, 1978-82 (Co-chariman of Scientific Symposiums at the 1981 and 1982 Annual Meetings)

Consultant to Family Crisis Intervention System, Erie County Mental Health Commissioner, Erie County, PA. Assisted this group in establishing a state-wide model of crisis intervention utilizing mental health and police personnel, 1974-75

CURRICULUM VITAE

NAME: Keith Kellogg Hunt, Jr.                      DATE OF RANK: 3 June 1977  
RANK: Colonel, Medical Corps                      MOS: 60F  
SSN: [redacted]                      MILITARY SERVICE: 1 July 1962 to present  
CURRENT ASSIGNMENT: Chief, Department of Medicine, Walter Reed Army Medical  
Center, Washington, DC 20012 (Telephone: 576-1205)  
BUSINESS ADDRESS: Box 300, Walter Reed Army Medical Center, Washington, DC 20012

DATE OF BIRTH:  
PLACE OF BIRTH:  
RELIGION:  
NAME OF SPOUSE:  
DATE MARRIED:  
CHILDREN:  
HOME ADDRESS:



Ex 6

PROFESSIONAL EDUCATION AND TRAINING

University of Virginia University of Virginia Medical School	[redacted]	BA, Psychology MD
Rotating Internship Tripler Army Medical Center Honolulu, Hawaii	Jul 1962 - Jun 1963	
General Practice Walson Army Hospital Fort Dix, New Jersey	Sep 1965 - Aug 1966	
Internal Medicine Residency Walter Reed Army Medical Center Washington, DC	Sep 1966 - Aug 1969	
Pulmonary Fellowship Walter Reed Army Medical Center Washington, DC	Sep 1969 - Aug 1970	

SPECIALTY CERTIFICATION:

American Board of Internal Medicine	23 October 1970
Diplomate in Subspecialty of Pulmonary Disease	17 October 1972
Recertification, American Board of Internal Medicine	29 October 1977

PROFESSIONAL ASSIGNMENTS:

Chief, Department of Medicine Walter Reed Army Medical Center Washington, DC 20012	1 July 1982
Medical Consultant to the Surgeon General	5 January 1982 - 1 July 1982
Chief, Pulmonary Disease Service Walter Reed Army Medical Center Washington, DC 20012	1 July 1974 - 1 July 1982
Consultant to the Surgeon General in Pulmonary Disease	27 August 1980
Associate Professor, Internal Medicine Uniformed Services University of the Health Sciences Bethesda, Maryland	14 January 1980
Pulmonary Division Program Coordinator Department of Medicine Uniformed Services University of the Health Sciences Bethesda, Maryland	August 1978
Clinical Assistant Professor of Medicine Georgetown University Washington, DC	1 July 1977
Chief, Pulmonary and Infectious Disease Service Madigan Army Medical Center Tacoma, Washington	24 August 1970 - 30 June 1974
Director, Clinical Clerkship Program Madigan Army Medical Center Tacoma, Washington	March 1972 - March 1974
Attending Physician Harborview Medical Center Seattle, Washington	October 1971 - June 1974
Battalion Surgeon 27th Infantry Battalion, 25th Infantry Division Schofield Barracks, Hawaii	July 1963 - August 1965

PROFESSIONAL SOCIETIES

Society of Medical Consultants to the Armed Forces (Associate Membership), 20 April 1982  
Fellow American College of Physicians, March 1974  
Fellow American College of Chest Physicians, October 1973  
American Thoracic Society  
Maryland Thoracic Society  
District of Columbia Thoracic Society  
Association of Military Surgeons of the United States

SPECIAL HONORS

Distinguished Military Graduate, ROTC, University of Virginia	1958
Meritorious Service Medal	11 November 1974
Outstanding Teacher Award - Presented by the Intern Class of 1971, Madigan Army Medical Center	1971
Selected for ACP-MKSAP Faculty, Washington, DC	September 1977
"A" Professional Designator Award, US Army	December 1979
Selected for ACP-MKSAP Faculty, Washington, DC	February 1980
Meritorious Service Medal	4 March 1980
American College of Chest Physicians Governor for the Army	October 1981
Army Achievement Medal	28 September 1981
Selected to Order of Military Medical Merit	13 November 1982

COMMITTEE ASSIGNMENTS

Human Subjects Research Review Board for the Surgeon General US Army	Jan - Jul 1982
Member, Steering Committee of the Section on Clinical Pulmonary Medicine of the American College of Chest Physicians	November 1981
Walter Reed Army Medical Center Steering Committee on Holistic Medicine	1981
Department of Medicine Education Committee, Walter Reed Army Medical Center	December 1978
Executive Committee, District of Columbia Thoracic Society	July 1976 - June 1977
Education Committee, Walter Reed Army Medical Center	July 1974 - present
Education Committee, Madigan Army Medical Center	Sep 1970 - Jun 1974
Rabies Committee, Madigan Army Medical Center	Sep 1970 - Jun 1974
Infection Committee, Madigan Army Medical Center	Sep 1970 - Jun 1974

PUBLICATIONS

- Hunt, KK. The second-strength PPD test. NEJM 1971; 28:1326 (Letter).
- Epstein R, Cole R, Hunt KK. Pleural effusion secondary to pulmonary cryptococcosis. Chest 1972; 61:296-298 (case report and review).
- Matthews JI, Molitor JT, Hunt KK. Pyrimethamine-induced leukopenia and thrombocytopenia in a patient with malaria and tropical sprue: Case report. Military Medicine 1973; 138:280-283 (case report and review).
- Schwartz MI, Goldman AL, Roycroft DW, Hunt KK. Vascular invasion by chondrosarcoma simulating pulmonary emboli. Am Rev Resp Dis 1972; 106:109-113 (case report and review).
- Epstein RL, Hall RV, Gillespie JT, Hunt KK. Asymptomatic right lower thoracic nodule. Chest 1972; 62:741-742 (case report).
- Hunt KK. Post-cyclophosphamide pneumonitis. NEJM 1972; 287:668-669 (letter).
- Hunt KK, Cole R. Cardiomegaly and pectus excavatum. Chest 1973; 64:511-512 (case report).
- Hunt KK, Epstein RL. Pulmonary sarcoidosis simulating metastatic malignancy: Case report. Military Medicine 1974; 139:552-553 (case report).
- Hunt KK. Book review of Respiratory Physiology. Military Medicine 1975; 140:116.
- Patterson JR, Blaschke TF, Hunt KK, Meffin PJ. Lidocaine blood concentrations during fiberoptic bronchoscopy. Am Rev Resp Dis 1975; 112:53-57 (article).
- Hunt KK, Enquist RW, Bowen TE. Multiple pulmonary nodules with central cavitation. Chest 1976; 69:529-530 (case report and review).
- Ward GW, Hunt KK, Evans R, Hase TS. Immunofluorescent techniques in examination of lung pathology. J Allergy and Clin Immunology 1976; 57:218 (abstract).
- Tellis CJ, Hunt KK. Eosinophilic granuloma of the lung. Military Medicine 1978; 143:256-262 (review).
- Hunt KK. Book review of Broncho-Pulmonary Immunopathology. Military Medicine 1978; 143:178.
- Hooper RG, Tellis CT, Hunt KK. Methodology in transbronchial lung biopsy. Chest 1977; 73:130 (letter).
- Hunt KK. Book review of Recent Advances in Respiratory Medicine. Military Medicine 1977; 142:886.
- Hunt KK. Book review of Pulmonary Emergencies. Military Medicine 1978; 143:551.
- Hunt KK. Book review of Practical Points in Pulmonary Disease. Military Medicine 1978; 143:702.

- Hunt KK. Book review of Respiratory Physiology II. Military Medicine 1979; 144:66
- Matthews JI, Torrington KG, Hunt KK. Superior vena cava syndrome. Am Rev Resp Dis 1979; 119:683-684 (case report).
- Hunt KK. Book review of Lung Sounds. Military Medicine 1979; 144:202.
- Hunt KK. Book review of Status Asthmaticus. Military Medicine 1979; 144:332.
- Hunt KK. Book review of Pulmonary Tuberculosis, A Journey Down The Centuries. Military Medicine 1979; 144(6):424.
- Matthews JI, Hooper RG, Hunt KK. Hernia of foramen of Morgagni presenting as pleural mass. Southern Med J 1979; 72:1348-1349.
- Hunt KK. Book review of Tuberculosis - Discussions in Patient Management. Military Medicine 1979; 144:807.
- Hunt KK. Book review of Selected Papers in Respiratory Therapy. Military Medicine 1979; 144:822.
- Beechler CR, Enquist RW, Hunt KK, Ward GW, Knieser MR. Immunofluorescence of transbronchial biopsies in Goodpasture's syndrome. Am Rev Resp Dis 1980; 121:869-872 (article).
- Hunt KK. Book review of Pulmonary Physiology in Clinical Medicine. Military Medicine 1980; 145:846.
- Spratling L, Hunt KK, Tellis CJ. Diagnosis of blastomycosis by transbronchial lung biopsy. Military Medicine 1981; 146:279-280 (case report).
- Rajagopal KR, Abbrecht PH, Tellis CJ, Hunt KK. Hypercapnic and flow resistive loading responses in obstructive sleep apnea patients. Am Rev Resp Dis 1981; 123(4):188.
- Rajagopal KR, Abbrecht PH, Derderian SS, Bennett LL, Doblal DD, Kahn RC, Ray C, Hunt KK. High frequency ventilation in bilateral broncho-pleural fistula. Am Rev Resp Dis 1981; 112(4):67.
- Hunt KK. Book review of Manual of Clinical Problems in Pulmonary Medicine. Military Medicine 1981; 146:406.
- Hunt KK. Book review of The Lung: Radiologic-Pathologic Correlations. Military Medicine 1981; 146:538.
- Derderian SS, Rajagopal KR, Abbrecht P, Bennett LL, Doblal D, Hunt KK. High frequency positive pressure jet ventilation in bilateral bronchopleural fistulae. Critical Care Medicine 1982; 10:119-121.
- Hunt KK. Book review of Obstructive Pulmonary Disease. Military Medicine 1982; 147:233.
- Hunt KK. Book review of Clinical Pulmonary Medicine. Military Medicine 1982; 147:413.

Hunt KK. Book review of Manual of Acute Respiratory Care. Military Medicine 1982; 147:599.

Hunt KK. Book review of Pulmonary Diseases. Military Medicine 1982; 147:1017.

Hunt KK. Book review of Pulmonary Emergencies. Military Medicine 1983; 148:121.

Hunt KK. Book review of Problems in Pulmonary Medicine for the Primary Physician. Military Medicine 1983; 148:274.

CURRICULUM VITAE

NAME: CLARA L. ADAMS-ENDER

RANK: Colonel

POSITION: Chief, Department of Nursing  
 Walter Reed Army Medical Center  
 Washington, D.C. 20307-5001

PERSONAL HISTORY:

- a.
- b.
- c.
- d.
- e.
- f.
- g.

EDUCATION:

INSTITUTION/PLACE	FROM/TO	MAJOR	DEGREE
NC Agricultural & Technical State University, Greensboro, North Carolina	[ ]	Nursing	BS
University of Minnesota Minneapolis, Minnesota		Med-Surg Nursing	MS
Command & General Staff College, Fort Leavenworth, Kansas		Military Art & Science	MMAS

MILITARY SERVICE SCHOOL	LOCATION	GRADUATION
ANC Officer Basic Orientation	Medical Field Service School, FSHTX	1961
Recovery Room & Intensive Care Surgical Nursing Course	Fitzsimons AMC, Denver, CO	1963
ANC Officer Basic Orientation	Academy of Health Sciences, FSHTX	1974
Chief Nurses Orientation Course	Academy of Health Sciences, FSHTX	1974
Command & General Staff College	Ft Leavenworth, KS	1976
Inspector General's Course	HQDA, Washington, DC	1976
Personnel Management for Executives	DA Regional Training Center, Europe	1979

EX 6

MILITARY SERVICE SCHOOL	LOCATION	GRADUATION
USAREC Recruiting Commanders' Course	Ft Ben Harrison, IN	1981
USAREC Recruiting Managers' Course	Ft Ben Harrison, IN	1981
US Army War College	Carlisle Barracks, PA	1982

PAST ASSIGNMENTS:

ORGANIZATION	LOCATION	POSITION	DATE
Walson Army Hospital	Fort Dix, NJ	Gen Duty Nurse	1961-1963
121st Evac Hospital	ASCOM, Korea	Staff Nurse	1963-1964
US Army Medical Trng Cen	Fort Sam Houston, TX	Instructor	1965-1967
WRAIN Center, University of Maryland	Washington, DC	Instructor/ Asst Prof	1969-1974
USAMEDDAC, Kimbrough Army Hospital	Fort Meade, MD	Asst Ch, Dept of Nursing	1974-1975
HQ, Health Services Command	Fort Sam Houston, TX	Insp General(IG)	1976-1978
Frankfurt Army Regional Medical Center	Frankfurt, West Germany	Asst Ch and Ch, Dept Nurs	1978-1981
US Army Recruiting Command	Ft Sheridan, IL	Ch, ANC Div	1981-1984
Walter Reed Army Medical Center	Washington, DC	Ch, Dep Nurs	1984-Pres

ACADEMIC APPOINTMENTS:

Instructors	WRAIN Center, Univ of MD School of Nursing	1969-1971
Assistant Professor	WRAIN Center, Univ of MD School of Nursing	1971-1974
Adjunct Assistant Professor	Georgetown Univ School of Nursing, Washington, DC	1985-Pres

PROFESSIONAL ORGANIZATIONS:

American Nurses Association	1962-Pres
National League for Nursing	1973-Pres
Sigma Theta Tau Honor Society	1968-Pres
Chi Eta Phi Sorority, Inc.	1972-Pres
Foundation of Thanatology	1970-Pres
American Organization of Nurse Executives	1980-Pres
Association of US Army	1976-Pres
Retired Army Nurse Corps Association	1981-Pres
Federal Women's Program	1977-Pres
American Red Cross Nurse (#33046)	1981-Pres
Member, Legislative Committee, DC Nurses Assoc.	1984-Pres

PROFESSIONAL ORGANIZATIONS:

American Nurses' Foundation Century Club  
ANA Council of Nursing Administration

1982-Pres  
1985-Pres

PUBLICATIONS:

"The Role of the Nurse in the Maintenance and Restoration of Hope".  
Bereavement: Its Psychosocial Aspects, ed. Schoenberg, et al., New York:  
Columbia University Press, 1975, (Co-author).  
Attitudes Toward Fear of Death and Dying Among Army Officers, Defense  
Documentation Center, Department of Army Washington, DC 1976.

"Department of Nursing Support to Ambulatory Care - Issues, Dilemmas and  
Proposed Solution", Medical Bulletin, September 1980.

"Development of Clinical Head Nurses as Managers of Nursing Care", Medical  
Bulletin, June 1981.

"Identify Crisis and Dilemmas in Ambulatory Health Care Delivery", Medical  
Bulletin, January/February, 1982.

"Answers to Questions About Army Nurse Recruiting," All Volunteer, February  
1984.

"Nurse Salaries", Recruiter Journal, May 1984.

HONORS:

\*First female in Army to qualify and be awarded the Expert Field Medical Badge  
in July 1967.

\*Secondary zone promotions to Major, Lieutenant Colonel and Colonel.

\*ANC selectee to attend Command & General Staff College (CGSC) in 1975.

\*First nurse, black and female to be awarded the Master of Military Art and  
Science Degree, CGSC, Fort Leavenworth, Kansas 1976.

\*First nurse and female to qualify and serve as Senior Marcher for 700 USAREUR  
soldiers in the four-day, 100-mile Nijmegen March, Nijmegen, Holland in July  
1980.

\*First black ANC Officer to graduate from the US Army War College (USAWC) in  
1982.

\*Awarded the "A" professional designator by TSG for continued demonstration of  
exceptional ability in the field of Nursing Administration in June 1985.

AWARDS AND DECORATIONS:

	<u>YEAR</u>
Army Commendation Medal	1967
Outstanding Young Woman of America	1968
Personality of the South	1969
Cum Laude Graduate University of Minnesota	1969
Meritorious Service Medal	1974
Female Athlete of the Year, CGSC	1975
Meritorious Service Medal w/2OLC	1978
Presidential Sports Award - Backpacking	1980
Omega Psi Phi Fraternity's Citizen of the Year	1981
Meritorious Service Medal w/3OLC	1982
Roy Wilkins Meritorious Service Award of the NAACP	1983
Certificate of Achievement - University of MN Distinguished Grad	1984
Who's Who in American Nursing	1984
Black Nurse of the Year	1985
The World Who's Who of Woman	1896

CONSULTANT POSITIONS;

Member of Editorial Board, Foundation of Thanatology	1970-1978
Nurse Consultant to Children's TV Workshop, NY	
Consultant to Chief, ANC on Recruitment & Retention of Minority Students in Nursing	1972-1975
Chief Nurse, 32nd Combat Support Hospital, 7th MEDCOM	1978-1979
Specialty Consultant, Medical-Surgical Nursing, 7th MEDCOM	1978-1981
Member, Visiting Committee, Frances Payne Boltonson, Case Western Reserve University, Cleveland, OH	1985-Pres
Nurse Consultant, WRAMC Health Services Region	1984-Pres

COMMUNITY ORGANIZATIONS & ACTIVITIES:

*National Association for Advancement of Colored People	Life Member
*Teaching of Conversational English to German Citizens	1978-1981
*Promoting of German-American Relations Among Health Care Professionals	1978-1981
*National Council of Negro Women	1972-Pres
*International Volksmarching Assn (IVV)	1980-Pres
*Board Member, NE Illinois Council, Boy Scouts of America	1983-1984
*US Army War College Alumni Assn	Life Member
*Member, Wash DC Area 500 Club in Bowling	1984-Pres
*NC A & T Alumni Association	1961-Pres
*University of Minnesota Alumni Association	1970-Pres
*Walter Reed Officers' Wives Club	1984-Pres
*Army Officers Wives Club of the Greater Washington Area	1985-Pres

PROFESSIONAL PRESENTATIONS:

<u>SUBJECT/TITLE</u>	<u>AUDIENCE/LOCATION</u>	<u>DATES</u>
Implementation of ANC Standards of Nursing Practice	Army Nurse Corps Executives/ HQ 7th MEDCOM, Heidelberg, FRG	Jun 1980
Identify Crisis and Dilemmas In Ambulatory Health Care Delivery	Ambulatory Patient Care Conf Garmisch, West Germany	Dec 1980

SUBJECT/TITLE	AUDIENCE/LOCATION	DATES
Nursing Opportunities in the Army Nurse Corps	Nurse Educators/ San Francisco, CA	Mar 1982
Ingredients of a Successful Person	Federal Womens Program	May 1982
Who am I? Where Am I Going?	Nurse Educators/ Washington, DC	Jun 1982
The Army Nurse Corps— An Opportunity for Excellence in Nursing Practice	Nurse Educators/ Washington, DC	Feb 1983
What are Qualities for Success in the Workplace?	Chicago Federal Womens Program, Chicago, IL	May 1983
Marketing the US Army Reserve for ANC Officers	USAR Chief Nurses/ St. Louis, MO	Jun 1983
ANC Opportunities in the US Army Reserve	Professional Nurses/ Cleveland, OH	Sep 1983
A Career of Excellence in the Army Nurse Corps	Nurse Educators and Students, Omaha, NE	Nov 1983
Preparation for Excellence in Nursing Practice	Connecticut Student Nurses Association Convention, Danbury, CT	Nov 1983
Getting Ready for Success in Life	Eastern Star Chapter, Waukegan, IL	Mar 1984
Nursing Career Opportunities in the Army Nurse Corps	Nurse Educators Boston, MA	Mar 1984
Preparing for Nursing Excellence Towards the Year 2000	Central Carolina Chapter of BNA, Durham, NC	Apr 1984
Management of Nursing Practice in a Major Medical Center	Nurse Educators, Washington, DC	Jun 1984
Research Paper- "Attitudes Toward Fear of Death and Dying Among Army Officers"	Nurse Educators/Graduate Students, Cal State Univ, Long Beach CA	Mar 1985
"Challenges of the Army Officer in the year 2000"	Keynote Speaker, ROTC Ball, Morgan State Univ, Balt., MD	May 1985
Achieving Excellence in Nursing Practice Through the Mentoring Process	Prof Nurses/NAACOG Convention, New Orleans LA	Jun 1985

SUBJECT/TITLE	AUDIENCE/LOCATION	DATES
"The Role of the Supervisor in Management"	Level I Supervisors Course WRAMC, Wash, DC	Jun 1985
"Utilizing the Nursing Process in Nursing Management"	Graduate Students, Georgetown University SON, Wash, DC	Feb 1985
Managing Complex Health Care Systems/Organizations	Graduate Students, Georgetown University SON, Wash, DC	Feb 1985

SHORT COURSES, WORKSHOPS AND CONFERENCES:

TITLE	LOCATION	DATE
Challenges and Opportunities for the Nurse Education and Administrator	San Francisco, CA	1982
Army Nurse Corps Strategic Planning	Nashville, TN	1982
The National Commission on Nursing Recommendations: Challenges and Opportunities Under Prospective Pricing	Chicago, IL	1983
The New Payment Environment and Financial Management for the Nursing Service Administrator	Dallas, Tx	1983
Army Nurse Corps Strategic Planning	Leesburg, VA	1983
Negotiating Skills (Amer Mtg Assn)	Washington, DC	1984
Health Services Command Chief Nurse Conference	San Antonio, TX	1984
AMSUS Convention	San Diego, CA	1984
Health Care Professionals Course on Alcoholism (Tri-Service alcohol Rehabilitation unit)	Bethesda, MD	1985
Investment in Excellence	Washington, DC	1986

SPECIALTY SKILLS

- a. Proficiency in German - Moderate
- b. Proficiency in Spanish - Beginner
- c.

EX 6

HOBBIES:



9/3

CURRICULUM VITAE

NAME:

Gary Bruce Clark, M.D.

DATE/PLACE OF BIRTH:

MARRIED:

SOCIAL SECURITY NUMBER:

HOME ADDRESS:

OFFICE ADDRESS:

Walter Reed Army Medical Center  
Washington, DC 20307

CURRENT PROFESSIONAL:  
APPOINTMENT:

Chief, Department of Pathology and  
Area Laboratory Service  
Walter Reed Army Medical Center  
Washington, DC 20307  
1 August 1983 Present

Pathology Consultant  
Surgeon General of the Army Pentagon  
Washington, DC  
1 August 1983 Present

\* \* \* \*

ACADEMIC EDUCATION

High School:

Monroe High School  
Monroe, Michigan  
[ ]

Undergraduate:

Bachelor of Science  
University of Colorado  
Boulder, Colorado  
[ ]

Medical:

Doctor of Medicine  
University of Colorado  
Denver, Colorado  
[ ]

EXC  
1

Internship: Pediatrics  
Yale-New Haven Hospital  
New Haven, Connecticut  
July 1967 - July 1968

Residency: Pathology (Anatomic/Clinical)  
Walter Reed Army Medical Center  
Washington, DC.  
July 1971 - July 1975

Fellowship: Neuropathology  
Department of Neuropathology  
Armed Forces Institute of Pathology  
Washington, DC.  
February 1978 - February 1980

Subspecialty Symposia: Mammalian and Human Medical Genetics  
Jackson Laboratory  
Bar Harbor, Maine  
23 July - 3 August 1979

MEDICAL LICENSURE: Ethiopia, 1973  
District of Columbia (No. 7307), 1974-  
Present  
Colorado (No. 20926), 1977 - Present

BOARD CERTIFICATION: American Board of Pathology  
Anatomic Pathology - May 1978  
Clinical Pathology - May 1978  
Neuropathology - May 1980

ACADEMIC APPOINTMENTS: Instructor in Neuropathology  
University of Alaska School of Medicine  
Fairbanks, Alaska  
August 1976 - August 1977

Assistant Professor of Pathology  
Uniformed Services University of the  
Health Sciences  
Bethesda, Maryland  
August 1978 - August 1980

Acting Chairman, Department of Pediatric  
Pathology  
Armed Forces Institute of Pathology  
Washington, DC. 20306  
1 July 1979 - 18 February 1980

Registrar, Registry of Pediatric  
Pathology/Medical Genetics  
American Registry of Pathology  
Armed Forces Institute of Pathology  
Washington, D.C. 20306  
1 July 1979 - 18 February 1980

\* \* \* \* \*

MILITARY HISTORY

Commission: U.S. Army - Reserve - 14 August 1967  
U.S. Army - Regular - 31 January 1980

Rank: Colonel - 4 August 1980

Professional Training: U.S. Army Medical Field Service School  
Fort Sam Houston, Texas  
August 1967

U.S. Army Infantry School (Airborne)  
Fort Benning, Georgia  
September 1968

U.S. Army Special Warfare School  
Fort Bragg, North Carolina  
October - December 1968

Armed Forces Staff College (Class #62)  
Norfolk, Virginia  
August 1977 - January 1978

Awards and Honors: Purple Heart, November 1969  
Bronze Star Medal, February 1970  
Bronze Star Medal, First Oak Leaf  
Cluster, February 1970  
Bronze Star Medal, Second Oak Leaf  
Cluster with V Device, May 1970  
Air Medal, July 1970  
Bronze Star Medal, Third Oak Leaf  
Cluster, September 1970  
Silver Star, November 1970  
Army Commendation Medal, January 1972  
Meritorious Service Medal, November 1977  
Humanitarian Service Medal, January 1979  
Joint Services Commendation Medal,  
January 1981  
Meritorious Service Medal, First Oak Leaf  
Cluster, July 1983

Foreign Awards and Honors:

Vietnamese Parachutist Wings, May 1969  
Vietnamese Cross of Gallantry with Silver  
Star, March 1970  
Greek Parachutist Wings, April 1971  
Danish Parachutist Wings, May 1971

\* \* \* \*

ORGANIZATIONAL MEMBERSHIP:

American Association of Blood Banks  
American Association of Military Surgeons  
American Society of Clinical Pathologists  
(Fellow)  
American Society of Human Genetics  
College of American Pathologists (Fellow)  
International Academy of Pathology  
Pediatric Pathology Club  
Washington Society of Pathologists  
Paleopathology Association

ORGANIZATIONAL OFFICES:

American Association of Blood Banks  
Inspection and Accreditation Program,  
1977 - Present  
National Membership Committee  
1979 - Present

College of American Pathologists  
Inspection and Accreditation Program,  
1980 - Present  
Deputy Commissioner for European  
Inspection Program 1980 -1983

ELECTED SOCIETIES:

Alpha Epsilon Delta, 1960  
Phi Sigma Society, 1962  
American Alpine Club, 1981

\* \* \* \*

PRIOR PROFESSIONAL  
APPOINTMENTS

Orthopedic Orderly  
Denver, City Hospital  
Denver, Colorado  
June - September 1980

Research Assistant in Neuroembryology  
University of Colorado  
Boulder, Colorado  
June - September 1961

Research Virologist in Pediatrics  
University of Colorado Medical School  
Denver, Colorado  
(Including three months at National  
Institute of Infectious Disease and  
Allergy, Bethesda, Maryland)  
September 1964 - September 1965

General Medical Officer  
U.S. Army Special Forces  
Ban Me Thuot, RVN  
February 1969 - July 1970

General Medical Officer  
U.S. Army Special Forces, Europe  
Bad Toelz, FRG  
July 1970 - July 1971

Chief of Pathology/Chief of Professional  
Services  
Operation New Arrivals  
47th Field Hospital  
Fort Chaffee, Arkansas  
April - June 1975

Chief of Pathology/Chief of Professional  
Services  
Bassett Army Hospital  
Fort Wainwright, Alaska  
August 1975 - July 1977

ARFOR Command Surgeon  
Joint Readiness Exercise JACK FROST  
172nd Infantry Brigade  
Fort Wainwright, Alaska  
1977

Staff Pathologist  
Department of Neuropathology  
Armed Forces Institute of Pathology  
Washington, DC 20307  
2 February 1980 - 15 July 1980

Commander  
209th General Dispensary  
Hanau, FRG  
16 July 1980 - 30 May 1981

Surgeon  
VII US Corps  
Stuttgart, FRG  
1 June 1981 - 15 July 1983

Blood Bank Consultant  
7th Medical Command  
Stuttgart, FRG  
23 October 1981 - 15 July 1983

\* \* \* \*

PROFESSIONAL  
PRESENTATIONS

Course Director  
Frozen Blood: Theory and Applications  
American Society of Clinical Pathologists  
October 1974, Washington, DC.  
May 1975, Las Vegas, Nevada  
October 1975, Chicago, Illinois  
May 1976, Dallas, Texas

Course Director  
Pediatric Pathology for General Patho-  
logists  
Armed Forces Institute of Pathology  
5 - 9 November 1979

Course Director  
Pathology of Genetic Disease  
Armed Forces Institute of Pathology  
11 - 15 February 1980

PUBLICATIONS

Abstracts: The effect of Cortisone on Inflammation in Rabbits; Clark, G.B. and Fulginitie, V.; Fed Proc Abstracts, 1965.

Journals: 1. Shatsky, S.A.; Alter, W.A.; Evans, D.E.; Ambrustmacher, V. and Clark, G.: Traumatic Distortions of the Primate Head and Chest: Correlation of Biomechanical, Radiological and Pathological Data; 18th Stapp Car Crash Cong., 1974.

2. Polesky, H.F.; Clark, G.B.; and Radcliff, J.H.: Frozen Blood Theory and Applications, ASCP Workshop Handbook, 1974.

3. Spees, E.K.; Pool, P.; Sullinger, W.O.; Clark, G.B.; Passerti, F.A.; Sperry, D.; Woodbury, M.A.; Amos, D.B.: HLA Genetic Structure of an Eritrean Semitic Group. In Kissmeyer-Nielson, F., Ed.; Histocompatibility Testing, Copenhagen, Munksgaard, p. 213, 1975.

4. Clark, G.B.: Petroleum, Petrochemicals and Health Care: Energy Issues in Health, DHEW Publication No. (HRA) 79-14510 (1979).

5. Clark, G.B. and Cline, B.: Impact of Oil Shortage on Medical Plastics; Public Health Reports, May - June 1981.

Text: General Pediatric Pathology, Part III (Syllabus); Clark, G.B.,  
LTC; Armed Forces Institute of Pathology, Washington, DC., 1981

CURRENT ON-  
GOING PROJECTS:

1. Classical genetics, embryology and neuroanatomy of anencephalics. Co-investigators: Everett K. Spees, Jr., Department Surgery, Baltimore City Hospitals; Paul I. Yakovlev, Department of Neuropathology, Armed Forces Institute of Pathology.
2. Correlation of anencephaly with renal function or deformity. Co-investigators: Everett K. Spees, Jr., Department of Surgery, Baltimore city Hospitals.
3. Correlation of clinical prenatal screening and survival prognosis of anencephaly. Co-investigator: Everett K. Spees, Jr. Department Surgery, Baltimore City Hospitals.
4. Correlation of neurological (brain death) criteria with anencephaly. Co-investigator: Everett K. Spees, Jr., Department of Surgery, Baltimore City Hospitals.
5. Correlation of clinical problems, moral and ethical standards and strategy for renal transplantation from anencephalic donors. Co-investigator: Everett K. Spees, Jr., Department of Surgery, Baltimore City Hospitals.
6. Immunoglobulin and HLA polymorphism of a South Vietnamese population group. Co-investigator: Everett K. Spees, Jr., Department of Surgery, Baltimore City Hospitals.
7. Clinical medical characterization of an Ethiopian Eritrean population group. Co-investigator: Everett K. Spees., Jr., Department of Surgery, Baltimore City Hospitals.
8. Correlation of the histology and clinical prognosis of pilocytic astrocytomas of the cerebrum. Co-investigator: James M. Henry, Department of Neuropathology, Armed Forces Institute of Pathology.
9. Correlation of the histology of intracranial teratomas and antigen markers for germ cell elements. Co-investigator: Maria Rueda-Pedraza, Department of Pediatric Pathology, Armed Forces Institute of Pathology.
10. Correlation of modern technocracy to future medical care.

CURRICULUM VITAE

NAME: Raoul O. Hagen

DATE AND PLACE OF BIRTH: [ ] [ ]

PREMEDICAL EDUCATION: B.A., University of Iowa, 7

MEDICAL EDUCATION:

School: M.D., Univ. of Iowa Medical School, [ ]

Internship: Rotating, St. Benedict's Hospital, Odgen, Utah  
1 July 1958 - 30 June 1959

Residency: Radiology, Tripler Army Hospital, 1963-1965  
Radiology, Walter Reed General Hospital, 1965-1966

MILITARY ASSIGNMENTS:

Clinical Clerk, Letterman General Hospital, July-September 1957.

Army Senior Medical Student Program, Iowa City, Iowa, September 1957-June 1958

General Medical Officer, Prison doctor, Dermatologist, and Flight Surgeon,  
Fort Leavenworth, Kansas, 1959-1963

Radiologist and Chief, Radiation Therapy Service, Department of Radiology  
Brooke General Hospital, 1967-1968

Chief of Radiology, 93rd Evacuation Hospital, Vietnam  
September 1968 - September 1969

Chief, Professional Services, 93rd Evaluation Hospital, Vietnam  
1 March - 1 September 1969

Consultant in Radiology, USARV  
June-August 1969.

Radiologist, Brooke General Hospital  
September 1969 - July 1970

Chief, Department of Radiology, Brooke Army Medical Center  
July 1970 - June 1979

Radiology Consultant to Health Services Command  
1975 - June 1979

Radiology Consultant to The Surgeon General  
January 1978 - July 1982

Chief, Department of Radiology, Tripler Army Medical Center  
July 1979 - August 1984

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Curriculum Vitae (con't)  
Raoul O. Hagen, M.D.

Chief, Department of Radiology, Walter Reed Army Medical Center  
September 1984 - present

Radiology Consultant to The Surgeon General  
September 1984 - present

ACADEMIC APPOINTMENTS:

Clinical Instructor, University of Texas Health Science Center, San Antonio  
1967

Clinical Assistant Professor, University of Texas Health Science Center,  
San Antonio, 1968-1970

Clinical Associate Professor, University of Texas Health Science Center,  
San Antonio, 1970-1974

Clinical Professor, University of Texas Health Science Center, San Antonio  
1 September 1974 - June 1979

Associate Clinical Professor, University of Hawaii, John A. Burns School of  
Medicine, Honolulu, HI, 1982 - 1984

PROFESSIONAL ORGANIZATIONS:

American College of Radiology  
Radiological Society of North America  
Long Binh Radiological Society

BOARD CERTIFICATION:

American Board of Radiology, December 1967

HONORS:

Prefix "A" in Radiology  
Who's Who in Texas  
Who's Who in the South and Southwest  
Recipient, Magna Cum Laude Award, Radiological Society of North America,  
1971, for scientific exhibit  
Elected a Fellow, American College of Radiology, 1981

LICENSURE:

Texas  
California  
Iowa

Curriculum Vitae (con't)  
Raoul O. Hagen, M.D.

**PUBLICATIONS:**

Gastric bezoars: A frequent complication in the postoperative ulcer patient. Radiology, 197:341-344, May 1973.

Carcinoma of the testis: An analysis of 104 patients with germinal tumors of the testis other than seminoma. Cancer, 31:633-640, March 1973.

Scientific exhibit on "Multisystem radiographic analysis of complications in thermally burned patients", Radiological Society of North America, 1971.

CURRICULUM VITAE  
JAMES FYPFE MCNAB, JR., MD

PERSONAL DATA:

Date & Place of Birth:

Citizenship:

United States

Marital Status:

Wife's Name:

Home Address:

Home Phone:

Hospital Address:

Radiation Oncology Service  
Walter Reed Army Medical Center  
Washington, D.C. 20307-5001

Hospital Phone:

(202) 576-1180

CURRENT POSITION:

Chief, Radiation Oncology Service  
Walter Reed Army Medical Center

Radiation Oncology Consultant to the  
United States Army Surgeon General

ACADEMIC TRAINING:

[ ]

The Citadel  
Charleston, S.C.

B.S. Biology

[ ]

Medical College of Georgia  
Augusta, Georgia

M.D.

Exp 6

1977 - 1978 Internship (Surgery)  
Letterman Army Medical Center  
Presidio of San Francisco, California

1978 - 1981 Residency, Therapeutic Radiology  
Medical College of Georgia  
Augusta, Georgia

ACADEMIC AWARDS AND HONORS:

Four Year ROTC Scholarship  
The Citadel 1969-1973

Who's Who In American Colleges and Universities  
The Citadel 1973

Four Year Medical School Scholarship  
(601-112) 1973-1977  
Medical College of Georgia

Clinical Fellowship  
American Cancer Society  
1980-1981

PROFESSIONAL CERTIFICATION:

1978 Diplomate, National Board of Medical Examiners, #181266

1981 Diplomate, American Board of Radiology in Therapeutic Radiology

PROFESSIONAL EXPERIENCE:

1980 - 1981 Chief Resident, Radiation Oncology Department  
Medical College of Georgia

1981 - 1985 Chief, Radiation Oncology Service  
William Beaumont Medical Center  
El Paso, Texas 1981

PROFESSIONAL ORGANIZATION:

1984 to present	American Society for Therapeutic Radiology and Oncology
1981 to present	Southwest Oncology Group
1978 to 1981	Southeastern Cancer Study Group

PROFESSIONAL LICENSURE:

1978 to present	Georgia Medical License #19724
-----------------	--------------------------------

MILITARY SERVICE:

1973	Commissioned into U.S. Army
1985	Currently Serving with the Rank of Major, U.S. Army Medical Corps.

# American College of Radiology

MEMBER



*Be it known by these presents that the Board of Chancellors  
of this College, by the authority vested in it, has elected*

*James F. McNab, Jr., M.D.*

*to membership in the  
American College of Radiology*

*Given this 15th day of September, 1983*



*Gerald D. Dodd, Jr., M.D.*  
CHAIRMAN OF THE BOARD OF CHANCELLORS

*Rue W. Harris*  
EXECUTIVE DIRECTOR

The Medical College of Georgia Hospitals  
Veterans Administration Hospital - Eugene Calhoun Memorial Hospital - University Hospital

Augusta



Georgia

This Certifies that

James Nyffe Mc Nab, Jr., M.D.

has satisfactorily completed a term of service as

Resident in Therapeutic Radiology

from July 1, 1978 to June 30, 1981.

In Testimony Whereof we affix our signatures at

Augusta, Georgia this 30th day of June, 1981.

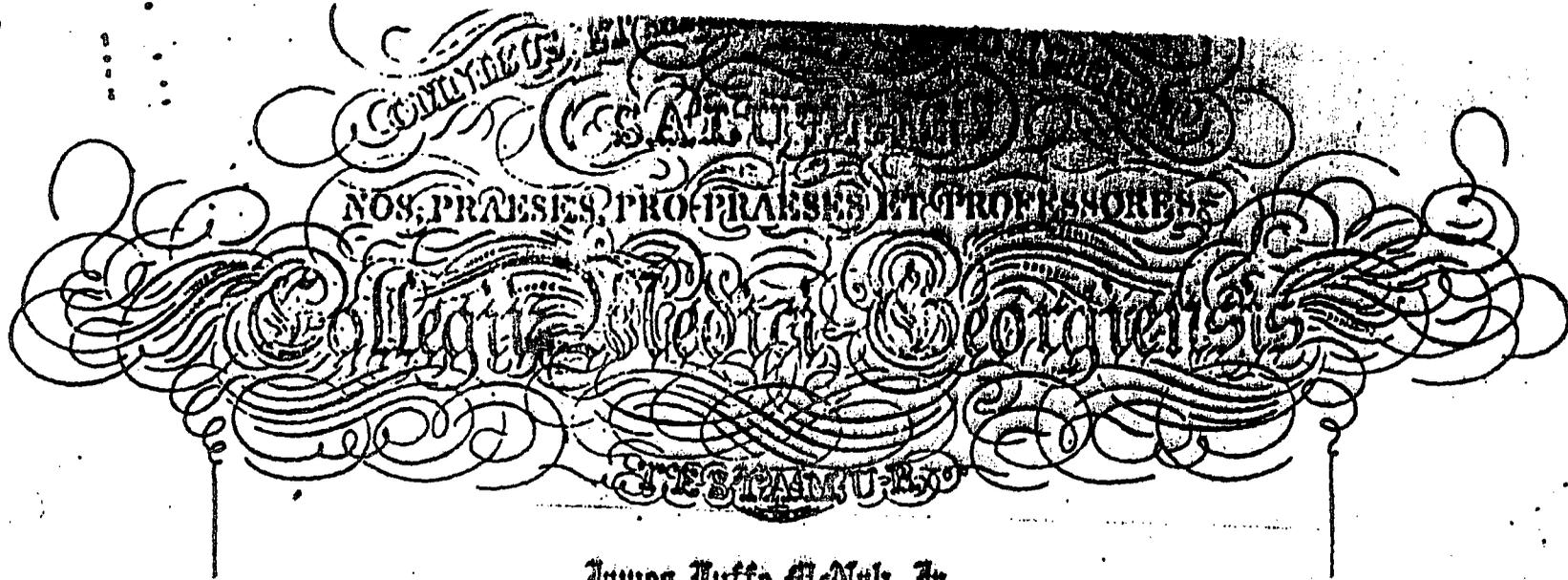
*W. H. M. M. M.*  
President, Medical College of Georgia

*F. Ross*  
Dean, Medical College of Georgia

*Donald Van*  
Administrator, Eugene Calhoun Memorial Hospital

*J. M. P. 1 1*

*7 1 1 1 1*



James Byffe McNab, Jr.

*Postquam se suaeque in Re medicae progressus probasset a nobis esse honoratum*

*Gradi Medicinae Doctoris.*

*Eique huius Diplomatis virtute potestatem plenissimam Medicinam muneris ubique gentium exercendi;  
singulaque iura, honores et privilegia quae Doctori Medicinae, alibi gentium conceduntur, concedimus.*

*In cuius fidem, literis haece. Communis Sigillo Collegii munitis, nomina nostra subscribimus.*

*Millesimo Nongentesimo Septuagesimo Septimo Mensis Junii Die Undecimo.*

*Georg. L. King, Jr. Cancellarius*

*Frederick L. Combs Decanus*

*Wm. H. May, Praeses*

*Walter M. Jones, Jr. Scriba*

DOUGLAS VAN NOSTRAND  
CURRICULUM VITAE

Date of Birth  
Place of Birth

[ ]

EDUCATION

High School

The Lawrenceville School  
Lawrenceville, New Jersey

Undergraduate

Duke University,  
Durham, North Carolina  
Degree: BS

Postgraduate

Emory University School of Medicine  
Atlanta, Georgia  
Degree: M.D.

Internship

Wilford Hall Medical Center  
San Antonio, Texas  
Internal Medicine  
Director: Gerald Parker, M.D.  
1973-1974

Residency

Wilford Hall Medical Center  
San Antonio, Texas  
Internal Medicine  
Director: Charles Coltman, M.D.  
1974-1976

Fellowship

National Naval Medical Center  
Bethesda, Maryland  
Nuclear Medicine  
Director: Peter T. Kirchner, M.D.  
1976-1978

Diagnostic Ultrasound  
Training Program

Thomas Jefferson University  
Philadelphia, Pa  
Trainee - 3 month course  
Director: Barry Goldberg, M.D.  
1977

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BOARD CERTIFICATION

Diplomate of National Board of Medical Examiners:	Number 148723, July 1, 1974
Diplomate of American Board of Internal Medicine:	Number 55825, June 16, 1976
Diplomate of American Board of Nuclear Medicine:	Number 04406, Sept. 30, 1978

PRESENT POSITION

Chief, Division of Nuclear Medicine	Walter Reed Army Medical Center Washington, D.C. July 1980 to present Lt Colonel
-------------------------------------	---

APPOINTMENTS

Assistant Professor	Department of Radiology and Nuclear Medicine Uniformed Services Univ of Health Sciences Bethesda, Maryland 14 January 1980 to present
Assistant Clinical Professor	Department of Radiology George Washington University Washington, D.C. July 1981 to present

PREVIOUS POSITIONS

Chief, Division of Nuclear Medicine	Malcolm Grow Medical Center Andrews Air Force Base Washington, D.C. June 1978 - June 1980
Chief, Division of Ultrasound	Malcolm Grow Medical Center Andrews Air Force Base Washington, D.C. June 1978 - June 1980
United States Air Force	Commissioned June 1969 (Active Duty from June 1973 to July 1980)
United States Army	Interservice Transfer, July 1980 (Active Duty from July 1980 to present)

Douglas Van Nostrand  
Curriculum Vitae

AWARDS

United States Air Force Commendation Medal

January 5, 1981

LICENSES

State of Maryland  
District of Columbia

Number 321922, March 15, 1978  
Number 12489, October 1980

SOCIETIES

Society of Nuclear Medicine  
American College of Physicians  
American College of Nuclear Physicians

PRESENTATIONS

D. Van Nostrand, M.D., W.R. Janowitz, M.D., D.R. Holmes, M.D., H.A. Cohen, M.D.,  
"Accuracy of Radionuclide Multiple Gated Acquisition (MUGA) in the Assessment of  
Myocardial Wall Motion."

- World Federation of Nuclear Medicine and Biology, Second International Congress, September 1978.
- Society of Nuclear Medicine, Mid-Eastern Chapter, Eighth Annual Meeting, April 1978.
- American College of Physicians, Society of the Air Force Physicians, February 1978.
- American Heart Association, 51st Scientific Session, October 1978.

D. Van Nostrand, M.D., W.R. Janowitz, M.D., H.R. Adams, M.S., P.T. Kirchner, M.D.,  
"Comparison of Tc-99m Methylene Diphosphonate (MDP) and Tc-99m Pyrophosphate."

- Society of Nuclear Medicine, Mid-Eastern Chapter, Seventh Annual Meeting, March 1977

Douglas Van Nostrand  
Curriculum Vitae

D. Van Nostrand, M.D., P.J. Murphy, M.D., N. Holland, M.D., C.C. Atkins, M.D., F.H. Gerber, M.D., "Efficacy of Postoperative Bone Scanning in the Management of Breast Carcinoma."

- American College of Physicians, Society of the Air Force Physicians, March 1979.
- Society of Nuclear Medicine, Mid-Eastern Chapter, Ninth Annual Meeting, April 1979.
- American Roentgen Ray Society Annual Meeting April 1980.

D. Van Nostrand, M.D., "Gallium Scanning in the Detection of Abdominal Abscesses."

- American College of Surgeons, Spring Surgical Symposium, Walter Reed Army Medical Center and Uniformed Services of Health Sciences April 1981.

D. Van Nostrand, M.D., "I-131 Chest Survey and Metastatic Thyroid Carcinoma."

- Walter Reed Radiological Symposium, May 1981.

M.H. Goldman, M.D., N. Ward, M.D., F. Shawl, M.D., D. Van Nostrand, M.D., "Multiple Cardiac Sequellae of Nonpenetrating Chest Trauma: Noninvasive Assessment and Management."

- Army Association of Cardiology, Brooke Army Medical Center, May 1981.

J. Garcia, M.D., D. Van Nostrand, M.D., W.H. Howard, M.D., R.W. Kyle, B.S., "Spectrum of 67-Gallium Renal Activity in Patients with No Evidence of Renal Disease."

- Society of Nuclear Medicine, Mid-Eastern Chapter, Thirteenth Annual Meeting, April 1983.

R.C. Smallridge, M.D., M.H. Goldman, M.D., K. Raines, M.D., D. Van Nostrand, M.D., "Left Ventricular Function in Hyperthyroidism: Studies Using Radionuclide Angiography."

- Army Association of Cardiology, Dwight Eisenhower Army Medical Center, May 1983.

BOOK REVIEWS

"Nuclear Medicine, Focus on Clinical Diagnosis", Military Medicine, 146:716, 1981.

"Clinical Nuclear Medicine", Military Medicine, 146:876, 1981.

"1982 Yearbook of Nuclear Medicine", Military Medicine, 147:872, 1982.

Douglas Van Nostrand  
Curriculum Vitae

ABSTRACTS/PAPERS

D. Van Nostrand, M.D., W.R. Janowitz, M.D., H.R. Adams, M.S., P.T. Kirchner, M.D.,  
"Comparison of Tc-99m Methylene Diphosphonate (MDP) and Tc-99m Pyrophosphate."  
Medical Imaging, Abstract, September 1977.

W.R. Janowitz, M.D., D. Van Nostrand, M.D., D.R. Holmes, M.D., Lt Cmdr H. Cohen,  
"Evaluation of Segmental Left Ventricular Wall Motion by Multiple Gated Radionuclide  
Angiography", Circulation, Abstract, Vols. 57 and 58, Supplement II, pp II-9, October  
1978.

D. Van Nostrand, M.D., W.R. Janowitz, M.D., D.R. Holmes, M.D., H.A. Cohen, M.D.,  
"Evaluation of Segmental Left Ventricular Wall Motion by Multiple Gated Radionuclide  
Angiography", Catheterization and Cardiovascular Disease, Vol 5, No 3, pp 547-555,  
1979.

D. Van Nostrand, M.D., R.C. Smallridge, M.D., "Thyroid Trapping of Technetium-99m  
During In Vivo Labeling of RBC's", J Nucl Med, 23:1146-1147, 1982.

D. Van Nostrand, M.D., J.H. Corley, R.W. Kyle, R.E. Stotler, "Utility of Selective  
Spleen Scintigraphy in Clarification of Equivocal Defects on Liver/Spleen Scan", J  
Nucl Med, 24:559-562, 1983.

30 August 1985

CURRICULUM VITAE

STOOPS, HOWARD CECIL, RPh

Phone : Home:  
Work

I. PERSONAL:

- A.
- B.
- C.
- D.

II. ACADEMIC AND PROFESSIONAL EDUCATION:

[ ] Duquesne University, Pittsburgh PA; B.S. Pharmacy

MAR 85 Triservices Nuclear Pharmacy Orientation Course

MAY 85 Safe Use And Handling Of Radioisotopes Course

JUL 85 Nuclear Pharmacy Extended Training Course

AUG 85 Advanced Nuclear Medicine Technologist Training Course

Military Education

JAN 80 - MAR 80 Medical Service Corps Officer Basic Course,  
Ft. Sam Houston TX

MAR 80 - APR 80 Medical Service Corps Pharmacy Officer Orientation Course  
Ft. Sam Houston TX

III. PROFESSIONAL LICENSE:

A. Registered Pharmacist, Certificate # RP-030846-L , Pennsylvania State  
Board of Pharmacy , September 1979

Ex 6

**IV. PROFESSIONAL EXPERIENCE;**

- SEP 1985 to Present Chief, Nuclear Pharmacy Department, Nuclear Medicine Service, Walter Reed Army Medical Center, Washinton, D.C.
- SEP 1984 to SEP 1985 Nuclear Pharmacy Residency Course, Nuclear Medicine Service, Letterman Army Medical Center, Presidio of San Francisco, CA
- APR 1982 to AUG 1984: Chief Sterile Products, Inpatient Pharmacy Service Dwight David Eisenhower Army Medical Center, Ft. Gordon GA.
- APR 1980 to MAR 1982: Staff Pharmacist, Outpatient Pharmacy Service Dwight David Eisenhower Army Medical, Ft. Gordon GA.
- SEP 1979 to DEC 1979: Staff Pharmacist, Eckerds Drug Store Erie, PA



DEPARTMENT OF THE ARMY  
**CERTIFICATE OF TRAINING**

This is to certify that

CPT HOWARD C. STOOPS

has successfully completed

NUCLEAR MEDICINE TECHNOLOGY REVIEW COURSE

- 26 - 30 August 1985

*Robert J. Lull MD*

ROBERT J. LULL, MD, COL, MC  
Chief, Nuclear Medicine Service

Given at LETTERMAN ARMY MEDICAL CENTER



DEPARTMENT OF THE ARMY  
CERTIFICATE OF TRAINING

This is to certify that

HOWARD C. STOOPS

has successfully completed

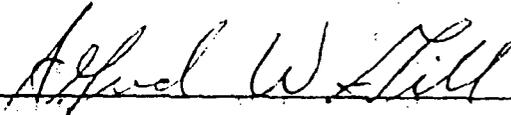
6F-H19, 18th Annual Triservices Nuclear Pharmacy Orientation Course

Universal Program Number: 185-602-85-02

Continuing Education Credit: 51.25 Contact Hours

11 March to 22 March 1985

Letterman Army Medical Center  
Given at Presidio, SF, California 94129-6700

  
ALFRED W. GILL

LTC, MSC  
Continuing Education Coordinator

"Academy of Health Sciences, Pharmacy Branch/  
Medicine and Surgery Division, is approved by  
the American Council on Pharmaceutical Education  
as a provider of continuing pharmaceutical  
education."





DEPARTMENT OF THE ARMY  
CERTIFICATE OF TRAINING

This is to certify that

CPT HOWARD C. STOOPS

has successfully completed

SAFE USE AND HANDLING OF RADIOISOTOPES

29 April - 10 May 1985

AMA Category I Credits Assigned: 66 Hours

Given by Letterman Army Medical Center & Letterman Army Institute of Research  
Presidio of San Francisco, California 94129

Cosponsor: The Surgeon General, Department of the Army, Washington, D.C.

*Sheldon R. Kiser*

SHELDON R. KISER, Ph.D.  
Professor of Medical Physics  
Program Director, LAMC

# U. S. Army Medical Department

Graduation



Certificate

*This is to certify that*

**Captain Howard C. Stoops, II, MS**

*has successfully completed the*

**Nuclear Pharmacy Residency Training Program**

*from* **31 August 1984** *to* **30 August 1985**

*given at* **Letterman Army Medical Center, Presidio of San Francisco, CA**

*this 30th day of* **August 1985**

A handwritten signature in cursive script, appearing to read "F. Bussey", followed by the initials "BG MC".

**Frederick N. Bussey, M.D.  
Brigadier General, MC  
Commanding**

CURRICULUM VITAE

for

DAVID E. HINTENLANG, PH.D.

Date & Place of Birth:

Home Address:

Home Telephone Number:

Office Address:

Health Physics Office  
Walter Reed Army Medical Center  
Washington, DC 20307-5001

Office Telephone Number:

(301) 427-5107

Degrees:

Ph.D. -

Physics [ 7 ]  
Brown University  
Providence, RI

M.Sc. -

Physics [ ]  
Brown University  
Providence, RI

M.S. -

Physics [ ]  
Bucknell University  
Lewisburg, PA

Other Education and Training:

1986

Laser and Microwave Hazards Workshop  
US Army Environmental Hygiene Agency  
Aberdeen Proving Ground, MD

1985

Health Care Administrator's Logistics  
Development Course  
Walter Reed Army Medical Center  
Washington, DC 20307-5001

1985

Medical Effects of Nuclear Weapons  
Armed Forces Radiobiology Research  
Institute  
Bethesda, MD

1985

Nuclear Hazards Training Course  
Interservice Nuclear Weapons School  
Kirtland Air Force Base, NM

Ex 6

HINTENLANG, David E. (Continuation of Curriculum Vitae)

1985 US Army Medical X-Ray Survey Techniques  
Course  
Academy of Health Sciences, US Army  
Fort Sam Houston, TX

1984 AMEDD Officer Basic Course  
Academy of Health Sciences, US Army  
Fort Sam Houston, TX

Experience:

Jan 1985 - Present

Walter Reed Army Medical Center  
Washington, DC 20307-5001  
Assistant Health Physics Officer  
Chief, Technical Services Branch  
Health Physics Office

Develop, direct and provide health physics services for WRAMC and all tenant activities. Develop, review, and direct Health Physics Training programs. Organize, equip, train and direct the operations of the Radiological Advisory Medical Team. Serve as first line Executive Agent for the WRAMC Radiation Control Committee to administrate requirements of Nuclear Regulatory Commission Licenses and DA Authorizations for the possession, storage, use and disposal of radioactive material at WRAMC and tenant activities. Provide interpretation and assure compliance with license conditions, Federal Laws, Army Regulations, and National Standards pertaining to ionizing and nonionizing radiation. Advise the Commander, WRAMC, and Radiation Protection Officer, on all other matters pertaining to ionizing and nonionizing radiation hazards.

Publications:

Hintenlang, David E., and Bray, P. J., "NMR Studies of Boron Sulfide-Based Glasses," Journal of Non-Crystalline Solids, 1985(6).

Bray, P. J., Hintenlang, D.E., and Mulkern, R. V., "NMR Studies of Fluoride and Fast Ion Conducting Glasses," Journal of Non-Crystalline Solids, 1983.

Bray, P. J., Hintenlang, D. E., Lui, M. L., and Mulkern, "Recent NMR Studies of Oxide, Fluoride and Superionic Conducting Glasses," Glastechnische Berichte, 1983.

HINTENLANG, David E. (Continuation of Curriculum Vitae)

Bray, P. J., Lui, M. L., and Hintenlang, D. E., "NMR Studies of Structure and Ion Motion in Glasses," Proceedings for the Third Otto Schott Symposium of Glasses, 1982.

Professional Membership:

American Physical Society  
Sigma Xi  
Health Physics Society  
(Baltimore-Washington Chapter)

NAME IN FULL: FRANKLIN HENRY TOP, JR.

RANK, CORPS, COMPONENT: Colonel, Medical Corps, US Army

SSAN: [ ]

DOB: [ ]

POB: [ ]

DATE ENTERED ACTIVE DUTY: 1 August 1966

DATE PRESENT RANK: 12 December 1974

DATE PERMANENT RANK: 28 January 1979

WIFE'S NAME: [ ]

CHILDREN'S NAME(S): [ ]

EDUCATION - MILITARY, CIVILIAN, DATE, DEGREE, SCHOOLS:

B.S., Yale University,  
M.D., Yale University, Cum Laude  
Pediatric Internship, University of Minnesota Hospital, 1961-62  
Pediatric Residency, University of Minnesota Hospital, 1962-64  
Basic Course, Medical Field Service School, Fort Sam Houston, TX 1966

MILITARY ASSIGNMENTS (IN ORDER; INCLUDE TITLE OF JOB):

Internist, Dept of Virus Diseases, DCD&I, WRAIR, 1966-68  
Asst Chief, Dept of Virus Diseases, DCD&I, WRAIR, 1968-70  
Chief, Dept of Virology (SEATO), 1970-73  
Chief, Pediatric Training Program (SEATO), 1972-73  
Deputy Director, US Army Medical Component, SEATO, 1972-73  
Chief, Dept of Virus Diseases, DCD&I, WRAIR, 1973-76  
Director, Division of Communicable Disease & Immunology (DCD&I), WRAIR, 1976-78  
Professor of Pediatrics, Uniformed Services University, 1978-  
Deputy Director, WRAIR, 1979-81  
Commander, US Army Med Rsch Inst of Cml Def, 1981-1983  
Director, Walter Reed Army Institute of Research, 1983-

MILITARY AWARDS, HONORS, BADGES:

Legion of Merit  
Meritorious Service Medal  
A Prefix

MEMBERSHIP, SCIENTIFIC COMMITTEES:

Member, Microbial & Infectious Disease Advisory Committee, National Institute of Allergy and Infectious Diseases, NIH, 1976-80.

Ex 6

FRANKLIN H. TOP, JR.  
Colonel, MC

PROFESSIONAL SOCIETIES:

Alpha Omega Alpha Honor Medical Society, 1960  
Certified, American Board of Pediatrics, 1966  
Society for Pediatric Research  
The American Society of Tropical Medicine and Hygiene  
American Society for Microbiology  
Infectious Disease Society of America  
American Association of Immunologists  
American Association for the Advancement of Science

PUBLICATIONS: See attached listings.

CURRICULUM VITAE

NAME: BASS, BILLY G.

SSAN: [ ]

GRADE/STEP: GS 14/8

DATE OF GRADE: August 22, 1967

DATE JOINED WRAIR: July 29, 1962

CURRENT POSITION TITLE: Director

DEPARTMENT:

DIVISION: Instrumentation

DATE OF BIRTH: [ ]

HOME ADDRESS: [ ]

TELEPHONE #: [ ]

NAME OF SPOUSE: [ ]

CHILDREN'S NAMES: [ ]

DATE OF BIRTH: [ ]

WHOM TO NOTIFY  
IN CASE OF EMERGENCY:

TELEPHONE #:

Ex 6

EDUCATION

<u>School</u>	<u>Dates attended</u>	<u>Degree(s)</u>	<u>Major</u>
Univ. of Maryland (Overseas Extension)	Jan. 1952-May 1964	none	Liberal art
N.C. State College UCLA	Jan. 1959-June, 1961	BS Nuc. Eng. none	grad. studies
Univ. Md., Coll. Pk. G.W.U., Wash, D.C.	Sept. 1962-June, 1964	None MS Engineering	grad. studies Electronic
G.W.U., Wash, D.C.		<del>Doctoral Candidate</del> PHD	Elec. Engineerir

EXPERIENCE

a. Prior to coming to WRAIR:

<u>Dates</u>	<u>Position</u>
June, 1958 - Jan., 1959	Newport News Shipbuilding & Drydock C Nuclear Engineer
Jan., 1959 - July, 1962	Douglas Aircraft Co., Aerospace Div. Electronics Engineer (Radar and microwave systems design, nuclear rocket instrumentation system design)

b. Since coming to WRAIR:

1962 - 1967	Chief, Electronics Sect, Div. Nuc. Med
1967 - 1970	Chief, Dept. Nucleonics, Div. Nuc. Med
1970 - 1972	Ass't Chief, Dept. AIA, Div. Biochemis
1972 - 1976	Chief, Dept. Analytical Chem, Div. Bio
1976 -	Director, Instrumentation Division

MILITARY SERVICE (If appropriate)

Dates: August, 1950 - June, 1954

Rank: Sgt. (Airman First Class)

Branch: U.S. Air Force

Awards: Good Conduct Medal

Service Ribbon

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PROFESSIONAL ORGANIZATION MEMBERSHIP (including any offices held)

Institute of Electrical and Electronic Engineers

American Nuclear Society

Association for the Advancement of Medical Instrumentation

AWARDS

Outstanding Performance Award

1964

1967

1971

Certificate of Achievement - WRAIR

1976

MISCELLANEOUS (Hobbies, Special Interests, etc.)



Ex 6

## PUBLICATIONS

(COMPLETE CITATION)

1. Bass, B.G., Effects of Particle Radiation on Selected Electronic Components, Douglas Aircraft Company Report A2-260-S/VE-M295, March 2, 1962.
2. Bass, B.G., New Walter Reed Multiple Crystal Whole Body Counter, San Diego Biomedical Engineering Symposium, 16-18 March 1966.
3. Levri, Elvio A., Runyan, Thomas E., Bass B.G., Mahin, D.T., Diagnostic Applications of Neutron Activation Analysis in Medicine, Second International Conference on Medical Physics, August 11-15, 1969.
4. Bass, B.G., Ryan, E.L., Gardner, H.B., Mahin, D.T., The Walter Reed Multiple Crystal Whole Body Counter, Second International Conference on Medical Physics, 11-15 August 1969.
5. Bass, B.G., Plan for the Dismantling of a Research Nuclear Reactor, March, 1970. (Master's Thesis, George Washington University School of Engineering and Applied Science).
6. Bass, B.G., Wisla, S., Miller, V., Health Physics Aspects of Dismantling a Research Nuclear Reactor, Health Physics Annual Meeting, 15 June 1972.
7. Bass, B.G., Holman, E.C., The Walter Reed Research Reactor Dismantling Project, Transactions of American Nuclear Society, Vol. 15, No. 2, Nov. 1972.
8. Bass, B.G., Use of Excess Weapons System Computers in Biomedical Instrumentation, U.S. Army ADP Symposium, 15 Nov. 1972.. (Abstract)
9. Khouri, Edward M., Olsson, Ray A., Bedynek, Julius L., and Bass, Billy G., "An Implantable Semiconductor Beta-radiation Detector," Am. J. Physiol. 323(1), 1977.

## ACCOMPLISHMENTS

1962 - 1967 Chief, Electronics Section, Division of Nuclear Medicine, WRAIR

In this position I was responsible for supervising the efforts of 4-6 technicians in the design, development and implementation of unique and sophisticated nuclear medical instrumentation systems for research and clinical use.

### Specific Accomplishments

1. Redesigned and renovated and placed back into operation the Walter Reed Whole Body Counter. This was the old 4-pi HUMCO type counter. This counter was then used for two years as a clinical research tool. See Photo. 1.
2. Designed and supervised the construction of the most sophisticated whole body counter in the world (at that time). See photo 2. This system encompassed state-of-the-art developments in low level radiation detector design and configuration, shielding, and data processing capabilities.
3. Designed and supervised the construction of one of the first three-probe renogram systems to be put into clinical practice. See photo 3. This system was the forerunner of a commercial system still in use on the Renal Transplant Ward (38) WRGH for use in early detection of rejection of transplanted kidneys.
4. Designed and directed the construction of one of the first total body scanners to be used in clinical nuclear medicine service. See photo 4. This system differed from conventional scanners of the time in that it was designed to be used in conjunction with an overhead fluoroscopy unit to get both scan and fluoroscopy image of the same subject.
5. Designed a sophisticated cell sizing system using the Coulter transducer and a small special purpose computer (multi channel pulse height analyzer) for storing and displaying the cell volume distributions. This system was used extensively by G. Bahr, AFIP, Bryan Bull, MD, at the Clinical Center, NIH, Merrell C. Johnson, COL, MC, WRGH, and others for various studies of mammalian cell, lymphocyte or bacteria volume distributions. A commercial version of the system is still in operation in the Division of Biochemistry.

6. Studied the computer requirements for the Walter Reed Army Institute of Research and wrote the Data Automation Request (DAR) in accordance with the requirements of AR 1-251 (now AR 18-2) and drafted the technical specifications for a computer facility for the WRAIR. This work resulted in the formation of the Division of Biometrics and Medical Info. Proc., WRAIR, and the acquisition of the CDC 3300 computer.

7. Served on the initial criticality team for the Walter Reed Research Reactor (WRRR). Held Operator's License and Senior Reactor Operator License from the U.S. Atomic Energy Commission for the L-54 nuclear reactor. Designed a transistorized control system for the reactor. Designed numerous instruments and systems for use in the radiobiological research program and for basic research in radiation detection and dosimetry.

1967 - 1970 Served as Chief, Department of Nucleonics, Division of Nuclear Medicine, WRAIR

This department consisted of about 22 professional and technical personnel, the Walter Reed Research Reactor, Walter Reed Whole Body Counting Facility, Automated Instrumental Analysis Laboratory, Neutron Activation Analysis Laboratory, Radiation Dosimetry Laboratory and Electronics Section.

#### Specific Accomplishments

1. Served as Technical Director, WRRR.
2. Established with C.R. Angel one of the first neutron activation analysis laboratories dedicated solely to medical problems.
3. Set up one of the first radiopharmaceutical production facilities directly connected with a clinical facility ( $^{18}\text{F}$  was produced here and used for bone scanning in the Nuclear Medicine Service, WRGH).
4. Served as consultant to St. Luke's Hospital Center in New York City, in nuclear medicine instrumentation.
5. Served as advisor in nuclear instrumentation to Consultant, Nuclear Science, OTSG, DA.
6. Appointed to Reactor Safeguards Committee, U.S. Army Pulse Radiation Facility, Ballistics Research Laboratory, Aberdeen, Md. (still serving)

7. Appointed to Reactor Test Planning Committee, Harry Diamond Laboratory Radiation Facility (DORF) (still serving).

8. Developed a plan for the dismantling of the Walter Reed Research Reactor.

9. Took a Master of Science in Engineering degree from George Washington University through evening study.

1970 - 1972 Served as Assistant Chief, Dept. of Automated Instrumental Analysis, Division of Biochemistry, WRAIR. (Actually, since LTC Angel was Deputy Director, Division of Biochemistry, I was de facto head of the department).

During this period, in addition to many of the aforementioned duties, I planned and directed the defueling, dismantling and decommissioning of the WRRR. This was the first nuclear reactor of this size ever to be completely dismantled. All other reactors of this size, even those on AEC reservations, had only been defueled and partially dismantled or mothballed but none had been dismantled in a building such as the WRAIR. This project was accomplished at less estimated cost, within the projected time and without disruption of normal operations at the WRAIR.

1972 - 1976 Served as Chief, Department of Analytical Chemistry (about 30 professional and technical persons), Div. of Biochemistry, WRAIR

Spent academic year (1972) at George Washington University completing course requirements and qualifying examinations for doctorate in engineering under sponsorship of Dept. of Army long term training grant.

Managed and directed research staff in the development of methods and instrumentation for the assay of drugs of abuse in human tissues and fluids. Directed research project in studying the excretion patterns of methaqualone in humans. A paper authored by Kazyak et. al. resulted from this effort.

Directed the development of a gas chromatographic method for assaying cocaine in human body fluids.

Directed the establishment of a mass spectrometry laboratory for use in biomedical research. Several papers on marijuana metabolism in humans have resulted from this effort.

Established and initially directed the technical group that developed the assay methodology for nerve gas and antidote in human fluids.

Course Director for "Advances in Biochemical Instrumentation at WRAIR Jan. - Feb. 1975.

1976 - present    Serve as Director, Instrumentation Division

Manage operations of three departments - Glassworking, Metal-Plastics, and Electronics - dedicated to the design and development of unique biomedical instrumentation systems. Serve as consultant in instrumentation science, electronics and nuclear science to the Director, WRAIR and the WRAIR professional and technical staff. Serve as WRAIR Radiation Safety Officer and WRAIR representation on WRAMC Radioisotope Committee. Serve as Chairman, WRAIR Capital Equipment Review Committee.

Perform research in biomedical electronics to develop new applications in military medical research. ~~Have completed academic requirements for~~ <sup>Received</sup> PhD in Electrical Engineering and Computer Science. Dissertation topic is "correlation of the visual evoked response with regional blood flow, electroencephalogram and extracellular potassium concentrations in the monkey."

CURRICULUM VITAE

IDENTIFICATION:

NAME

McCarthy, Michael James

PRESENT TITLE:

Chief, Pulmonary and Mediastinal Section  
Department of Radiologic Pathology  
Armed Forces Institute of Pathology

OFFICE ADDRESS:

Lt Col Michael J. McCarthy  
Chief, Pulmonary and Mediastinal Section  
Department of Radiologic Pathology  
Armed Forces Institute of Pathology  
Washington, D.C. 20306-6000

OFFICE PHONE:

(202) 576-2973

RANK:

Lt Col, USAF, MC

AFSC:

9536

SOCIAL SECURITY NUMBER:



SPECIALITY:

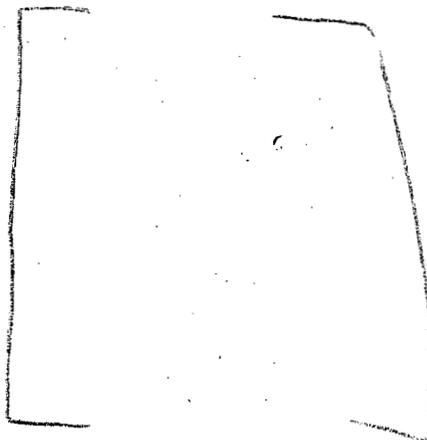
Diagnostic Radiology

DATE OF BIRTH:

PLACE OF BIRTH:

SPOUSE'S NAME:

CHILDREN:



EX 6

EDUCATION:

		<u>Degrees Conferred, Title or Status</u>	<u>Major/Subject</u>
[	] United States Air Force Academy Colorado Springs, CO	BS	Life Sciences
[	] Georgetown University School of Medicine Washington, D.C.	MD	
1975-76	Malcolm Grow USAF Med. Ctr. Suitland, Maryland	Internship	Rotating
1976	School of Aerospace Medicine San Antonio, Texas	Flight Surgeon	Short Course Aerospace Medicine
1978-79	Wilford Hall USAF Med. Ctr. San Antonio, Texas	Resident	Internal Medicine
1980-82	Wilford Hall USAF Med. Ctr. San Antonio, Texas	Resident	Radiology

CERTIFICATION:

Diplomate National Board of Medical Examiners, 1976  
Diagnostic Radiology American Board of Radiology, 1982

LICENSES:

1984-present Maryland Medical License

Principal Positions Held:

Jan-June 1982 Chief Resident, Radiology  
Wilford Hall USAF Medical Center  
San Antonio, Texas

Jan 1983 - May 1984 Assistant Chief, Chest Radiology  
Wilford Hall USAF Medical Center  
San Antonio, Texas

June - July 1984 Chief, Chest Radiology  
Wilford Hall USAF Medical Center  
San Antonio, Texas

August 1984 - present Chief, Pulmonary and Mediastinal Section  
Department of Radiologic Pathology  
Armed Forces Institute of Pathology  
Washington, D.C.

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MILITARY ASSIGNMENTS:

USAF Academy (Cadet) 1967-1971  
Georgetown University School of Medicine 1971-1975  
Malcolm Grow USAF Medical Center (Internship) 1975-1976  
USAF School of Aerospace Medicine (Student) July - September 1976  
USAF Academy (Chief, Clinical Services, Cadet Clinic 1976-1978  
Flight Medicine)  
Wilford Hall USAF Medical Center 1978-1984  
(Resident and Staff Radiologist)  
Armed Forces Institute of Pathology, WRAMC 1984 - present  
(Staff Radiologist)

MILITARY AWARDS:

Air Force Commendation Medal 1978  
Air Force Outstanding Unit Citation 1983  
Air Force Commendation Medal with 1st Oak Leaf Cluster 1984

PROFESSIONAL ACTIVITIES

Membership in Professional Organization:

1982 - present Radiologic Society of North America  
1983 - present America College of Radiology  
1986 - present Society of Thoracic Radiology

Professional Honors/Executive Positions Held:

1969 4th Cadet Group Sergeant Major, USAF Academy  
1970 37th Cadet Squadron Commander, USAF Academy  
1977 Flight Surgeon of the year, USAF Academy Command  
1982 Chief Resident, Diagnostic Radiology, Wilford Hall USAF Med. Ctr.

Postdoctoral Fellows Supervised:

1984-85 James Robinson, M.D.

Academic Positions

Chief Resident  
Department of Radiology  
Wilford Hall USAF Medical Center  
San Antonio, Texas  
1 January 1982 - 30 June 1982

Assistant Chief, Chest Radiology  
Department of Radiology  
Wilford Hall USAF Medical Center  
1 January 1983 - 31 May 1984

Chief, Chest Radiology  
Department of Radiology  
Wilford Hall USAF Medical Center  
1 June 1984 - 26 July 1984

Chief, Pulmonary and Mediastinal Radiologic Pathology  
Armed Forces Institute of Pathology  
Washington, D.C.  
4 August 1984 - Present

Assistant Professor of Radiology and Nuclear Medicine  
Uniformed Services University of the Health Sciences  
Bethesda, Maryland  
August 1985 - Present

Lectures Given on Regular Basis at the Radiologic Pathology Course  
(AFIP, Washington, D.C.)

Pulmonary and Mediastinal Radiology

1. Congenital Pulmonary Disease
2. Mediastinal Masses
3. Lung Carcinoma
4. Unusual Malignant Lung Neoplasms
5. Staging of Lung Carcinoma
6. Mycotic Pulmonary Disease
7. Pleura and Chest Wall

Cardiovascular Radiology

1. Echocardiographic - Pathologic Correlations
2. Coronary Arteriography

SCIENTIFIC EXHIBITS:

1. Whatley LR, McCarthy MJ, Helms CA, Genant HK: HLA-B27 Spondyloarthropathies - Rheumatoid Variants.  
Annual Meeting of the Radiological Society of North America  
Dallas, Texas - November 1980 (CME Credit Given)
  
2. Chasen MH, McCarthy MJ, Gilliland JD, Floyd JL:  
Concepts in Computed Tomography of the Thorax.  
Annual Meeting of the American Roentgen Ray Society.  
Las Vegas, Nevada - April 1984 (Certificate of Appreciation)  
  
Radiologic Society of North America, Annual Meeting  
Washington, D.C. - November 1985
  
3. McCarthy MJ, Ros PR, Sobin L, Robinson J, Viamonte M:  
Radiologic-Pathologic Correlations in Bronchogenic Carcinoma  
International Diagnostic Course, Davos, Switzerland - March 1985  
  
International Diagnostic Course.  
Davos, Switzerland - March 1986
  
4. McCarthy MJ, Ros PR, Sobin L, Robinson J, Viamonte M:  
Lung Carcinoma: Updated Imaging - Pathologic Correlation  
Annual Meeting of the Radiological Society of North America  
Chicago, Illinois - November 1985  
  
3rd International Symposium on New Medical Imaging  
Barcelona, Spain 1985  
  
MRI/CT/Ultrasound Correlations  
Bal Harbor, Florida - January 1986  
  
American Roentgen Ray Society, Annual Meeting  
Washington, D.C. - April 1986
  
5. Ros PR, McCarthy MJ, Hartman DS, Moser RP:  
Body Magnetic Resonance - Pathologic Correlation  
Annual Meeting of the Radiological Society of North America  
Chicago, Illinois - November 1985 (CME Credit Given)  
  
MRI/CT/Ultrasound Correlations  
Bal Harbor, Florida - January 1986  
  
American Roentgen Ray Society, Annual Meeting  
Washington, D.C. - April 1986
  
6. Ros PR, Olmsted WW, McCarthy MJ, Dachman AH, Hjermsstad B:  
Small Bowel Tumors with Little or No Malignant Predisposition  
Annual Meeting of the American Roentgen Ray Society  
Washington, D.C. - April 1986

EDUCATIONAL COURSE FACULTY PARTICIPATION AND TOPICS:

1. Seminar in General Diagnostic Radiology  
Bethesda, Maryland September 1984  
"Bronchogenic Carcinoma"  
"Staging of Bronchogenic Carcinoma"
2. 3rd Annual Cardiovascular Review Course  
Bethesda, Maryland May 1985  
"Coronary Arteriography"  
"Basic Echocardiography"
3. Pathologic Basis of Radiologic Diagnosis  
Bethesda, Maryland September 1985  
"Congenital Pulmonary Disease: Normal Development Gone Awry"  
Parts I, II  
"Masses in the Mediastinum", Parts I, II  
"Bronchogenic Carcinoma: A Pattern Approach"
4. American Osteopathic College of Radiology:  
Pathologic Concepts in Imaging. Cancun, Mexico January 1986  
"Masses in the Mediastinum", Part I, II  
"Mycotic Pulmonary Disease"  
"Pattern Approach to Bronchogenic Carcinoma"  
"Staging Bronchogenic Carcinoma"
5. Eighth Annual Radiologic-Pathologic Concepts in Diagnostic Radiology  
Orlando, Florida February 1986  
"Lung Carcinoma: A Pattern Approach"  
"Localized Congenital Cystic Pulmonary Disease"

PUBLICATIONS:

1. Schenk DA, Chasen MH, McCarthy MJ, Duncan CA, Christian CA: Potential false positive mediastinal transbronchial needle aspiration in bronchogenic carcinoma. Chest 85:696-697, 1984.
2. Chasen MH, McCarthy MJ: Pulmonary nodules: Detection of calcification by linear and pluridirectional movement in tomographic Study. Radiology 156:589-592, 1985.

CURRICULUM VITAE

NAME: KUEHNE, Ralph W., GS-13  
SSAN: [ ]  
DATE OF EMPLOYMENT: May 1958

ASSIGNMENT: Safety Officer and Quality Assurance Unit  
Headquarters, USAMRIID  
Fort Detrick, Frederick, Maryland (301) 663-7335

DATE & PLACE  
OF BIRTH:

HOME ADDRESS:

WIFE:

CHILDREN:

EDUCATION:

B.S. University of Illinois, Urbana, Illinois,  
[ ] Microbiology  
M.S. Frostburg State College, Frostburg, Maryland,  
[ ] Management  
30-35 Government or University Training Courses  
[ ] 1952-1985

CIVILIAN EXPERIENCE:

Bacteriologist, USDA, N. Util. Res. Br.,  
Peoria, Illinois, 1952-1955  
Bacteriologist, Physical Defense Division,  
Fort Detrick, Maryland, 1955-1958  
Microbiologist, US Army Medical Research Institute  
of Infectious Diseases, Fort Detrick, MD,  
1958-present

AWARDS OR DECORATIONS:

University Honors, Univ of Illinois, 1952  
Distinguished Service Team Award - 1955  
Special Act or Service Award - 1967  
Exceptional Performance Award - 1982, 1983, 1984,  
1985  
Miscellaneous Letters of Appreciation

MEMBERSHIPS:

American Society for Microbiology  
RESA  
National Regist. Microbiol.  
Canadian Assoc. for Biological Safety  
American Biological Safety Assoc.

HOBBIES OR INTERESTS:

OTHER:

Consultant with Toxicology and Bioresearch  
Services, Inc., in the areas  
of Microbiology, Drug Development, Quality  
Assurance, Laboratory Safety and Design, and  
Technical Writing and Editing.

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## EXPERIENCE

### 1. U. S. Army Medical Research Institute of Infectious Diseases, Fort Detrick, Frederick, Maryland

1977 - Present      GS-13 Microbiologist and Safety Officer. Serves as the Institute's Safety Officer and GLP Quality Assurance Unit. Major responsibilities include the formulation, interpretation and implementation of a wide range of microbiological, radiological and industrial safety policies and procedures. Applies an in-depth and highly specialized knowledge and experience in microbiology, chemistry and physics concerning a wide variety of research projects currently in progress or proposed throughout the Institute to assess hazards to assure biological containment and safe working conditions. Is responsible for establishing and maintaining internal procedures to assure compliance with the Good Laboratory Practice Regulation of the FDA. Performs the tasks and responsibilities involved in the monitorship of regulated studies to insure that the facilities, management, equipment, personnel, methods, practices, records and controls are in compliance. Supervises the activities of the Safety Technicians and Health Physics Technicians. Provides advice and guidance to outside agencies on the design, operation and certification of high-containment facilities.

#### Key Accomplishments

- Created and implemented a biological safety program for the Institute, including the formulation of policies and procedures for all levels of biohazard containment.
- Organized and implemented a comprehensive program for GLP compliance of regulated studies. Have monitored a total of 24 such studies for FDA submission.
- Designed and evaluated a biological containment facility for studying high-hazard infectious disease agents. This achievement was reported in a national journal, referenced in others, and over 400 reprint requests have been received.
- Served on the Planning Committee and as a Session Chairman for the National Biological Safety Conference.
- Have consulted on the design, construction, certification and operation of biological containment laboratories in Egypt, Japan, Argentina, Australia, Canada and the United States. Am currently actively consulting with US Navy and AID, which will necessitate four on-site visits to Cairo, Egypt.

◦ Served as visiting faculty member, Johns Hopkins University, 1980 - 1982.

◦ Received Exceptional Performance Award, 1982, 1983, 1984, 1985

2. U. S. Army Medical Research Institute of Infectious Diseases, Fort Detrick, Frederick, Maryland.

1958 - 1977

GS-9 through GS-13 Microbiologist. Engaged in aerobiological and other research studies with infectious disease agents and as EEO Counselor, Division Safety Officer, and Division Administrative Assistant. Major duties included the conduct of all aerobiological exposures of laboratory animals and human volunteers to various disease agents, necessitating extreme accuracy and precision. Planned, conducted and evaluated research on the chemotherapy of infectious diseases including the selection and evaluation of potential antiviral compounds and the development of model systems. Performed quantitative assays for antiviral compounds in stock solutions, body fluids, etc.

Key Accomplishments

- Was first to demonstrate feasibility of aerogenic immunization of animals with live, attenuated virus - both singly and in combination with a live, bacterial vaccine.
- Established LD<sub>50</sub>, LD<sub>100</sub> and ED<sub>50</sub> dose-level determinations for monkeys with aerosolized staphylococcal enterotoxin.
- Devised an aerosol measurement procedure for an agent of critical importance in man, representing a breakthrough in measurement control.
- Received a Special Act or Service Award in 1967 for the exposure of human volunteers to precise dosages of an aerosolized biological toxin, citing skill and ingenuity displayed.
- Isolated and characterized, in collaboration with other investigators from NIH, the causative virus of a fatal outbreak of hemorrhagic fever in Bolivia.
- Was first to inoculate rhesus monkeys with Machupo virus, leading to the development of an animal model for the study of this disease.

- Developed an indirect mouse model for the evaluation of potential antiviral compounds against Tacaribe virus.
- Assisted in the development of an indirect mouse model for the evaluation of potential antiviral compounds against yellow fever virus.
- Evaluated antiviral compounds against Japanese encephalitis virus and VEE virus infections in the mouse.
- Developed spectrophotometric assays for poly I-C and ribavirin.
- Was invited to participate in a symposium at the American Society of Microbiology annual meeting in 1979.
- Was the author or co-author of 16 papers during this period published in national or international scientific journals.

3. U. S. Army Biological Research Laboratories, Fort Detrick, Frederick, Maryland.

1955 - 1958

GS-9 Microbiologist. Engaged in research studies to develop and evaluate field sampling equipment and procedures for collection of bacterial and viral aerosols, including selection of components, development of assay procedures, and conduct of field tests.

Key Accomplishments

- Was the author or co-author of 2 papers during this period published in national scientific journals.

4. U. S. Dept. of Agriculture Northern Regional Research Laboratory, Peoria, Illinois.

1952 - 1955

GS-5 through GS-7 Bacteriologist. Performed research on the taxonomy of selected microorganisms. Maintained stock culture collection. Performed large-scale fermentation studies.

Key Accomplishments

- Was part of Unit receiving USDA Distinguished Service Unit Award for research on dextran.
- Was author or co-author of 4 papers during this period published in national scientific journals.

## REFERENCES

1. COL Richard F. Barquist, M.D., U.S. Army Medical Research and Development Command, Fort Detrick, Frederick, Maryland.
2. COL Clarence J. Peters, M.D., Chief, Medical Division, USAMRIID, Ft. Detrick, Frederick, Maryland
3. COL Robert Scott-McNair, M.D., Walter Reed Army Institute of Research, Washington, DC
4. Daniel F. Liberman, Ph.D., Massachusetts Institute of Technology, Cambridge, Massachusetts.
5. Jerry J. Tulis, Ph.D., School of Public Health, University of North Carolina Chapel Hill, NC.
6. Byron S. Tepper, Ph.D., Biohazard Safety Officer, The Johns Hopkins Medical Institutions, Baltimore, Maryland.
7. John Richardson, D.V.M., Center for Disease Control, Atlanta, Georgia.
8. Sharif El Said, Ph.D., Ein Shams Univ., Cairo, Egypt.
9. Julio I. Maiztegui, Ph.D., Inst. of Viral Hemorrhagic Diseases, Pergamino, Argentina
10. Mary Ellen Kennedy, Chief, Div. Of Biosafety, Laboratory Center for Disease Control, Ottawa, Ontario, Canada

Publications. by R. W. Kuehne

- (1) Haynes, W. C., R. W. Kuehne, and L. J. Rhodes. 1954. The effects of potassium upon the growth of Micrococcus pyogenes. Appl. Microbiol. 2:339-344.
- (2) Kuehne, R. W., and L. J. Rhodes. 1955. A portable rack for staining jars. Stain Tech. 30:159-160.
- (3) Kuehne, R. W., and H. M. Decker. 1957. Studies on continuous sampling of Serratia marcescens using a slit sampler. Appl. Microbiol. 5:322-323.
- (4) Kuehne, R. W. 1956. Scraper for transferral of large amounts of microbial growth. Chemist Analyst 45:26.
- (5) Haynes, W. C., R. W. Kuehne, and L. J. Rhodes. 1957. The effect of potassium upon the growth of Micrococcus pyogenes. II. The influence of incubation temperature and glucose. Appl. Microbiol. 5:382-385.
- (6) Decker, H. M., R. W. Kuehne, L. M. Buchanan, and R. Porter. 1958. Design and evaluation of a slit-incubator sampler. Appl. Microbiol. 6:398-400.
- (7) Kuehne, R. W., and W. S. Gochenour, Jr. 1961. Slit samplers for continuous collection of T<sub>3</sub> bacteriophage and Venezuelan equine encephalomyelitis. II. Studies with Venezuelan equine encephalomyelitis virus. Appl. Microbiol. 9:103-105.
- (8) ~~Kuehne, R. W., W. D. Sawyer, and W. S. Gochenour, Jr.~~ 1962. Immunization with aerosolized Venezuelan equine encephalomyelitis live virus vaccine. Am. J. Hyg. 75:347-350.
- (9) Jaeger, R. P., R. O. Spertzel, and R. W. Kuehne. 1961. Detection of airborne P. tularensis using the fluorescent antibody technique. Appl. Microbiol. 9:585-587.
- (10) Berdjis, C. C., C. A. Gleiser, H. A. Hartman, R. W. Kuehne, and W. S. Gochenour, Jr. 1962. Pathogenesis of respiratory anthrax in M. mulatta. Br. J. Exp. Pathol. 43:515-524.
- (11) Kuehne, R. W., W. D. Sawyer, and W. S. Gochenour, Jr. 1962. Modification of intraperitoneal infection with Bacillus anthracis spores in the rat by egg yolk and phosphatides. Bact. Proc. 77.
- (12) Gochenour, W. S., Jr., W. D. Sawyer, J. B. Henderson, C. A. Gleiser, R. W. Kuehne, and W. D. Tigertt. 1963. On the recognition and therapy of simian woolsorter's disease. J. Hyg. Camb. 61:317.

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#### ADDENDUM

I have had the following courses pertinent to my duties as Radiation Protection Offices, USAMRIID:

1. Radiation Protection Officer Workshop. AEHA, Edgewood, MD. 2-6 April 1979;

2. Ionizing Radiation Course. Frederick Cancer Research Center. Fort Detrick, MD, 26 April 1984;

3. Applied Radiation Protection. University of North Carolina, Savannah, GA, 6-10 August 1984;

4. Radiation Safety Issues in Laboratory and Clinical Research Institutions. NIH, Washington, DC, 16-17 December 1985;

I have been RPO, USAMRIID, since May, 1984, and was alternate RPO and recording secretary of the Ionizing Radiation Control Committee from December 1978-May 1984.

CURRICULUM VITAE

Name: James E. Stafforu

Current Duty Assignment: Alternate Radiation Protection Officer  
Chief, Radioactive Materials Control Branch  
Walter Reed Army Medical Center  
Washington, D.C. 20012

Home Address:  
Date of Birth:  
Place of Birth:

Home Telephone Number:

Office Telephone Number: (301) 427-5104

<u>EDUCATION:</u>	B.S.	General Science [ ]	University of Iowa Iowa City, Iowa
	A.A.	Radiation Science [ ]	Montgomery College Takoma Park, Maryland

EXPERIENCE:

April 1978-Present	Chief, Radioactive Materials Control Branch Alternate Radiation Protection Officer Walter Reed Army Medical Center Washington, D.C. 20012
Sept. 1972-April 1978	Radiation Protection Officer Department of the Army Harry Diamond Laboratories Adelphi, Maryland 20783
March 1971-Sept. 1972	Health Physicist Health Physics Office Armed Forces Radiobiology Research Institute Bethesda, Maryland 20014
Sept. 1970-March 1971	Physical Science Technician Health Physics Office Armed Forces Radiobiology Research Institute Bethesda, Maryland 20014
Summers 1966 1967	Physical Science Aid (Health Physics) Health Physics Office Department of Commerce National Bureau of Standards Gaithersberg, Maryland

Ex 6

STAFFORD, James E. (Continuation of Curriculum Vitae)

Additional Education and Training

1971	Occupational Radiation Protection Public Health Service Training Institute
1971	Accelerator Radiation Protection Public Health Service Training Institute
1971	Industrial Hygiene Measurements Public Health Service, NIOSH Training Institute
1972	Laser Safety USAML, Field Safety Activity
1973	System Safety USAML, Field Safety Activity
1975	Microwave Oven Survey Workshop U.S. Army Environment Hygiene Agency
1976	Nonionizing Radiation Public Health Service, NIOSA Training Institute
1977	Optical Radiation Measurements CDI Seminar Management
1978	Packaging and Transportation of Radioactive Material Nuclear Energy Waste Management Consultants
1978	Nuclear Hazards Training Course Interservice Nuclear Weapons School Kirkland AFB, NM
1978	Personnel Management for Supervisors, Level I & II WRAMC
<u>Membership:</u>	Health Physics Society

CHAPTER 3  
Authorization to Use Radioactive Material

3-1. General.

a. The NRC has issued a specific "License of Broad Scope for By-Product Material" to WRAMC allowing use of specific types and quantities of radioactive material. NRC requirements stipulate that a Radiation Control Committee be established to exercise administrative control over the safe use of radioactive materials. The WRAMC RCC was chartered to meet these requirements.

b. The RCC issues Radioactive Material Authorizations to Principal Users as a means of controlling the use of radioactive material. All users of radioactive material must receive their authorization prior to using the material.

c. Non-Human Use Radioactive Material Authorizations are issued for 3 years. Human Use Authorizations are issued for 1 year. Both types of authorizations may be renewed upon request.

d. Individuals possessing more than 1/2 pound of pure natural uranium compounds are required to obtain an authorization.

3-2. Application Procedure.

a. To obtain, amend, renew or terminate authorization for use of radioactive material, individuals must submit "Application to Use Radioactive Materials," WRAMC Form 1661-R-Human Use or WRAMC Form 1662-R-Non Human Use. Applications will be submitted to the HPO for review and approval. All applications for human use of radioisotopes must be submitted to the Human Use Subcommittee for review of physician training and experience before HPO review. Each Principal User and Co-Worker must submit WRAMC Form 1643, "Training and Experience of Authorized Radioisotope Users", with the application. Each physician listed on a Human Use Authorization is required to submit NRC Form 313-M, Supplement B, Preceptor Statement, with the application.

b. Protocols describing the use and accountability of Tritiated Thymidine, Phosphorous-32 and unbound Iodine from the time of receipt until the time of disposal will be submitted with the application. The HPO may require protocols for other radioisotopes.

c. All requested information on the application will be provided. Incomplete applications will be returned, causing a delay in approval.

d. Application for use of gamma cell irradiators must include a copy of the proposed SOP addressing personnel safety, routine operation and emergency provisions.

3-3. Review Procedures. All applications will be reviewed by the RCC and HPO to insure that individuals meet training and experience requirements, proposed procedures do not violate existing regulations and facilities and equipment are adequate for proposed usage. Applications will be signed by the HPO and returned to applicant. This is considered interim approval until the RCC next meets and officially approves the application.

3-4. Termination of Authorization. An authorization may be terminated by the Principal User, the RCC or the HPO at any time. When an authorization is terminated, the Principal User will insure that all work areas are cleared by the HPO prior to releasing them for alternate use and coordinate final disposition of unused radionuclides with the Radioactive Materials Control Branch, HPO.

## TRAINING AND EXPERIENCE OF AUTHORIZED RADIOISOTOPE USERS

1. NAME OF AUTHORIZED USER (Last, First, MI)	2. STATE OR TERRITORY IN WHICH LICENSED:  (MD, DDS, DVM, etc.)
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RANK/GRADE	ORGANIZATION	ORGANIZATIONAL DIVISION	BLDG./ROOM NO.	WRAMC AUTHORIZATION NO.
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### 3. CERTIFICATION

SPECIALTY BOARD A	CATEGORY B	MONTH AND YEAR CERTIFIED C

### 4. FORMAL EDUCATION HIGHEST ACADEMIC DEGREE ATTAINED

Higher Educational Institutions Attended	Type of Program Pursued and Dates of Attendance	Degree, Diploma or Certificate Received and Date
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

### 5. TRAINING RECEIVED IN BASIS RADIOISOTOPE HANDLING TECHNIQUES

FIELD OF TRAINING A	LOCATION AND DATE(S) OF TRAINING (Include course title if known) B	TYPE AND LENGTH OF TRAINING	
		LECTURE/ LABORATORY COURSES (Hours) C	SUPERVISED LABORATORY EXPERIENCE (Hours) D
a. RADIATION PHYSICS AND INSTRUMENTATION			
b. RADIATION PROTECTION			
c. MATHEMATICS PERTAINING TO THE USE AND MEASUREMENT OF RADIOACTIVITY			
d. RADIATION BIOLOGY			
e. RADIOPHARMACEUTICAL CHEMISTRY			

**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

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

DEVICE	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE

**8. CERTIFICATION:**

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

\_\_\_\_\_  
(Date Signed)

\_\_\_\_\_  
(Signature of Applicant)

MATERIALS LICENSE

Amendment No. 18

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, 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.

<p>Licensee</p> <p>1. Department of the Army Walter Reed Army Medical Center</p> <p>2. Washington, D. C. 20307-5001</p>	<p>In accordance with application dated October 13, 1989,</p> <p>3. License number 08-01738-03 is amended in its entirety to read as follows:</p> <hr/> <p>4. Expiration date May 31, 1991</p> <hr/> <p>5. Docket or Reference No. 030-06895</p>
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<p>6. Byproduct, source, and/or special nuclear material</p> <p>A. Cobalt 60</p> <p>B. Cesium 137</p> <p>C. Cobalt 60</p> <p>D. Cesium 137</p> <p>E. Cesium 137</p>	<p>7. Chemical and/or physical form</p> <p>A. Sealed sources (AECL Models C-166, C-167 or C-198)</p> <p>B. Sealed sources (AECL Model C-161 Type 8)</p> <p>C. Sealed sources (AECL Model C-198)</p> <p>D. Sealed sources (AECL Model C-161 Type-8)</p> <p>E. Sealed sources</p>	<p>8. Maximum amount that licensee may possess at any one time under this license</p> <p>A. 2 sources not exceed 16,000 curies each</p> <p>B. 2 sources not to exceed 2,100 curies each</p> <p>C. 2 sources not to exceed 26,400 curies each</p> <p>D. 2 sources not to exceed 2,100 curies each</p> <p>E. [ ]</p>
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<p>9. Authorized use</p> <p>A. To be used in AECL Gammacell 220 irradiator for medical research and development and radiation dosimetry.</p> <p>B. To be used in AECL Gammacell 40 Irradiator for small animal irradiation, medical research, development and radiation dosimetry.</p> <p>C. To be used in AECL Gammacell 220 Irradiator for medical research and development and radiation dosimetry.</p> <p>D. To be used in AECL Gammacell 40 Irradiator for medical research and development and radiation dosimetry.</p> <p>E. To be used in a [ ] irradiator to irradiate blood products.</p>
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CONDITIONS

10. Licensed material shall be used at WRAIR, Washington, D.C., and USAMRILD, Fort Detrick, Maryland.

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

FOIA- 2006-0238

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EX 2

**MATERIALS LICENSE  
SUPPLEMENTARY SHEET**

License number

08-01738-03

Docket or Reference number

030-06895

Amendment No. 18

(Continued)

**CONDITIONS**

11. A. Licensed material shall be used by individuals designated by the individual approved by the Radiation Control Committee.
- B. The Radiation Safety Officer for this license is Allen W. Anthony.
12. Sealed sources containing licensed material shall not be opened.
13. A. The sources specified in Items 7.A., 7.B., 7.C. 7.D. and 7.E. shall be tested for leakage and/or contamination at intervals not to exceed 6 months. Any source received from another person which is not accompanied by a certificate indicating that a test was performed within 6 months before the transfer shall not be put into use until tested.
- B. 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, the source shall be removed from service and decontaminated, repaired, or disposed of in accordance with Commission regulations. A report shall be filed within 5 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 involved, the test results, and corrective action taken. Records of leak test results shall be kept in units of microcuries and shall be maintained for inspection by the Commission. Records may be disposed of following Commission inspection.
- C. The licensee is authorized to collect leak test samples for analysis by individuals approved by the Radiation Control Committee, Walter Reed Army Medical Center or tests for leakage and/or contamination shall be performed by persons specifically licensed by the Commission or an Agreement State to perform such services.
14. 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 a person specifically licensed by the Commission or an Agreement State to perform such services.
15. Written instructions contained in application dated May 17, 1985 shall be followed and a copy of these instructions shall be made available to each individual using or having responsibility for use of licensed material. Any changes to these instructions shall have the prior approval of the U.S. Nuclear Regulatory Commission, Region I, ATTN: Chief, Nuclear Materials Safety Branch, 475 Allendale Road, King of Prussia, Pennsylvania 19406.

**MATERIALS LICENSE  
SUPPLEMENTARY SHEET**

License number	08-01738-03
Docket or Reference number	030-06895
Amendment No. 18	

(Continued)

**CONDITIONS**

16. 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 May 17, 1985
  - B. Letter dated April 8, 1986
  - C. Letter dated August 21, 1986
  - D. Application dated October 13, 1989
  - E. Letter dated November 22, 1989

For the U.S. Nuclear Regulatory Commission  
Original Signed By:  
By Thomas K. Thompson  
Nuclear Materials Safety Branch  
Region I  
King of Prussia, Pennsylvania 19406

Date DEC 07 1989

DEC 07 1989

License No. 08-01738-03  
Docket No. 030-06895  
Control No. 111556

Department of the Army  
Walter Reed Army Medical Center  
Charles E. Day, III, LTC  
ATTN: HSHL-HP  
Washington, D.C. 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) 337-5239, 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.

Department of the Army  
Walter Reed Army Medical Center

2

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

Sincerely,

**Original Signed By:**  
**Thomas K. Thompson**

Thomas K. Thompson, Health Physicist  
Nuclear Materials Safety Section C  
Division of Radiation Safety  
and Safeguards

Enclosures:

1. Amendment No. 18
2. Requirements for Materials Licensees

DRSS:RI  
Thompson/tlm

12/ /89

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ML 08-01738-03/LTR - 0002.0.0  
12/06/89

ABOVE CLASS C SOURCE/DEVICE INVENTORY SURVEY

Licensee's (name and address)

License #: 08-01738-03

Licensee Name: Department of Army  
Contact Name: David Burton  
Title: Chief RMC Branch  
Department: Walter Reed Army Med Ctr.  
Street: \_\_\_\_\_  
City: Wash. DC State: \_\_\_\_\_ Zip Code: 20307-5001  
Phone Number: ( ) 427-5104 Ext.: \_\_\_\_\_

Provide accurate and complete responses to each question below:

1) How many sealed sources and/or devices do you have that are above Class C (i.e. Am-241 > 27 mCi, Pu-238 or -239 > 27 mCi, Cm-244 > 27 mCi, Cs-137 > 910 Ci, or any other transuranic > 27 mCi with a half-life greater than five years)? Identify each source or device on the attached inventory sheet.

2) How do you dispose of your sources and/or devices? (check appropriate box) 4 sources  
None disposed of.

Manufacturer: \_\_\_\_\_  
Transfer to another licensee: \_\_\_\_\_  
Other: \_\_\_\_\_

If other, please elaborate: \_\_\_\_\_

3)a. Are you able to find and use an authorized recipient to purchase, dispose, or store any sources and/or devices that you no longer want? (check one) Yes \_\_\_\_\_ No \_\_\_\_\_

If no, please elaborate: \_\_\_\_\_

b. Are there any difficulties in using this authorized recipient? (check one) Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, please elaborate: \_\_\_\_\_

4) Additional comments - check here \_\_\_\_\_ and use back of this sheet.

Surveyor: TR Thompson Date: 12/7/89

Note: Activity levels described in question 1 were derived from limits established in 10 CFR 61 section 61.55. The levels were based on typical size sources.





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

MS-16  
P-7

REPLY TO  
ATTENTION OF:

22 NOV 1989

ESHHL-H-HP (385-11m)

MEMORANDUM FOR US Nuclear Regulatory Commission, Region I,  
Nuclear Material Section B, Attn: Mr. Tom  
Thompson, 475 Allendale Road, King of Prussia,  
Pennsylvania 19406

SUBJECT: Additional information requested to amend NRC License  
No. 08-01738-03

1. The information referred to (from our Broad Scope License No. 08-01738-02) in our amendment dated 16 October 1989 is enclosed. The material on training from Tab C Chapter 2 is provided (enclosure 1). The material on Personnel Monitoring from Tab C Chapter 5 and Tab D Condition No. 1 is provided (enclosures 2 & 3). Lists of radiation detection instruments available at Walter Reed and calibration procedures for same listed in Tabs E & F are provided (enclosures 4 & 5).

2. In addition to the lock on the irradiator itself and the key control procedures outlined in enclosure 7 of the original amendment dated 16 October 1989, room [ ] will be locked whenever not occupied or under the direct visual control of Blood Bank personnel. Ex 2

3. Lieutenant Anthony has recently spent 4-6 hours with Dr. Bill Bass (the principle user for the AECL Gammacell 40 and AECL Gammacell 220 irradiators at building 40) to familiarize himself with the use of sealed source irradiators. This includes personnel monitoring, instrumentation, and mechanical layout of sources, shielding and exposure chambers within the irradiators. In addition the contract with J. L. Shepherd for the new irradiator includes 8 hrs. of hands on training for approved users and Lieutenant Anthony and one or two other members of the Health Physics Office will attend.

4. If any other information is needed the point of contact is Mr. David W. Burton. We appreciate all your help in expediting this amendment as the program is ready to go, and the irradiator ready to ship.

*David W. Burton*

David W. Burton  
Chief, RMC Branch  
Health Physics Office

111556

Ex 2

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NOV 22 1989

CHAPTER 2  
Training

2-1. GENERAL. The NRC requires that training be given to any employee who works in or frequents the vicinity of any area controlled by the licensee for protection of individuals from exposure to ionizing radiation. The Commander, WRAMC, has implemented training programs pertaining to the hazards of radiation and the methods for minimizing those hazards for radiation workers and other personnel.

2-2. PROGRAMS.

a. Initial Briefing.

(1) The Principal User is responsible for individuals who work under or are associated with work areas designated on his Authorization for the Use of Radioisotopes. He is required to give and document an initial and annual briefing to those individuals which covers, at a minimum, the following:

- (a) WRAMC Notice to Employees
  - (b) Form NRC-3, Notice to Employees
  - (c) Title 10, Code of Federal Regulations, Parts 19, 20 and 21
  - (d) Information concerning the storage, transfer and use of radioisotopes allowed under his authorization
  - (e) Authorization to Use Radioisotopes (WRAMC Form 1661-R, Application for Authorization to Use Radioactive Material - Human Use and/or WRAMC Form 1662-R, Application for Authorization to Use Radioactive Material - Non-human Use)
  - (f) Hazards and protective measures associated with isotope usage
  - (g) Procedures for requesting a report of exposure to radiation
- (2) This briefing will be given and acknowledged by signing WRAMC Form 538, Radiation Worker Briefing.

b. Introductory Principles of Radiation Protection Course: This two-day course, given by the staff of the HPO, is designed to complete and reinforce training given by the Principal User. It provides supplementary training, in an academic setting, required for the safe handling of

CHAPTER 5  
Personnel Monitoring

5-1. GENERAL.

a. This chapter prescribes procedures and responsibilities for monitoring and recording occupational exposures to ionizing radiation from radiation producing devices and radioactive materials.

b. Each activity receiving personnel dosimetry service from HPO will designate a personnel dosimetry coordinator and alternate to assist HPO in the issue, exchange and collection of dosimetry devices.

c. Application for personnel dosimetry service must be initiated by the individual and submitted on a properly completed DD Form 1952, "Dosimeter Application and Record of Occupational Radiation Exposure", to the HPO. The HPO will evaluate the information on the application and issue appropriate dosimetry or provide written notification that dosimetry is not needed.

d. Assignment of a personnel dosimetry device to an individual does not automatically make him a radiation worker. Occasionally exposed individuals may be monitored to determine need for permanent issue of dosimetry devices.

5-2. FILM BADGES.

a. The whole body badge is the primary dosimetry device used at WRAMC and is the only device legally recognized for whole body dosimetry. Other devices such as TLD may be used to monitor portions of the body or as supplemental dosimeters.

b. A whole body badge will be worn only by the individual to whom it is issued.

c. WRAMC issued dosimetry will not be worn by personnel when occupationally exposed at other facilities.

d. Whole body badges will be worn on the front of the torso. In the event a protective garment, such as a lead apron, is worn the badge will be worn under the protective garment.

5-3. SUPPLEMENTAL MONITORING DEVICES. Additional personnel monitoring devices will be provided when necessary to monitor a portion of the body or to obtain more immediate data. These devices will be worn only by individuals to whom they are issued.

5-4. CARE OF MONITORING DEVICES. When not being worn, personnel monitoring devices will be stored in the designated place and turned in to the personnel dosimetry coordinator during designated exchange periods. Film badges are not

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

CONDITION NO. 1

For

RADIOACTIVE MATERIAL AUTHORIZATIONS

PERSONNEL DOSIMETRY

1. PERSONNEL DOSIMETRY ASSIGNMENT LEVELS

An appropriate personnel monitoring device or devices will be assigned to each individual as required by the Health Physics Officer. In addition, other personnel monitoring techniques (e.g., bioassay) will be utilized to evaluate personnel dosimetry as deemed necessary by the Health Physics Officer. Personnel monitoring devices will usually be assigned when individuals could potentially receive in excess of the following levels in a three (3) month period:

Whole Body, head and trunk, active blood forming organs, gonads or lens of the eye	63 millirems
<del>Skin of the whole body (other than hands, wrists, feet or ankles), forearms, and cornea of the eye</del>	<del>375 millirems</del>
Hands and wrists, or feet and ankles	938 millirems
Bone, thyroid, other organs, tissues and organ systems	250 millirems

2. APPLICATION FOR PERSONNEL DOSIMETRY SERVICE

a. Supervisors of individuals who are potentially exposed to occupational radiation doses in excess of the above values must require such individuals to submit an application for Personnel Dosimetry Service (DD Form 1952) to the Health Physics Office, WRAMC, prior to assignment to that work.

b. The procedure and responsibilities for processing the application are as follows:

(1) Individual Application for Personnel Dosimetry Service: The applicant has the responsibility to furnish:

(a) Individual data

(b) Previous occupational exposure history

LIST OF RADIATION DETECTION INSTRUMENTS

<u>TYPE</u>	<u>NUMBERS AVAILABLE</u>	<u>RADIATION DETECTION</u>	<u>RANGE</u>	<u>WINDOW THICKNESS (mgm/cm<sup>2</sup>)</u>	<u>USE</u>
Eberline 6112	6	beta, gamma	0-1R/hr	30	Surveys
Eberline E 120	10	beta, gamma	0-50mR/hr	30	Lab Surveys
Eberline PAC-ISA	1	gamma	0-2000kcpm	1.5	Monitor
Eberline PAC-ISAGA	2	gama	0-2000kcpm	0.5	Monitor
Eberline PRM-5	1	beta/gamma	N/A	N/A	Monitor
Eberline 140	4	beta, gamma	0-60kcpm	N/A	Monitor
Eberline PRM-5-3	1	beta, gamma	N/A	N/A	Monitor
Eberline PRM-6	3	beta, gamma	0-500cpm	N/A	Survey
Eberline PRS-1 (Rascal)	14	beta, gamma	0-999,999cpm	N/A	Monitor
Eberline RM-16	10	gamma	10 <sup>2</sup> -10 <sup>6</sup> cpm	N/A	Monitor
Eberline MS-3	4	beta, gamma	N/A	N/A	Monitor
Eberline PRN-4	1	neutron	0-5kR/hr	N/A	Monitor
Gamma Industries 250B	20	beta, gamma	0-1000mR/hr	30	Survey
Gamma Industries 252B	10	beta, gamma	0-1000mR/hr	30	Survey

<u>TYPE</u>	<u>NUMBERS AVAILABLE</u>	<u>RADIATION DETECTION</u>	<u>RANGE</u>	<u>WINDOW THICKNESS (mgm/cm<sup>2</sup>)</u>	<u>USE</u>
Ludlum 2	8	beta, gamma	0-50mR/hr	1.5	Survey
Ludlum 3	172	beta, gamma.	0-500mR/hr	30	Survey
Ludlum 3	7	alpha	0-500mR/hr	1.0	Survey
Ludlum 12S	1	gamma	N/A	N/A	Monitor
Ludlum 16S	1	gamma	0-500,000cpm	N/A	Monitor
Ludlum 28	31	gamma	N/A	30	Monitor
Ludlum 2000	1	gamma	N/A	N/A	Monitor
Ludlum 2200	1	gamma	N/A	N/A	Monitor
Victoreen 440	3	gamma	N/A	1.0	Measure
Victoreen 440RF	1	gamma	0-300mR/hr	N/A	Measure
Victoreen 471	10	alpha, beta, gamma	0-1R/hr	500mg/Cm <sup>2</sup>	Measure
Victoreen 808B	3	gamma	.1mR/hr-100mR/hr	N/A	Measure
Nuclear Data ND660MCA	1	gamma	N/A	N/A	Measure
Nuclear Data ND66	1	gamma	N/A	N/A	Measure
Canberra 2201	1	alpha, beta	N/A	N/A	Measure
Beckman LS-9800	1	beta	N/A	N/A	Measure
Packard AG-5780	1	gamma	N/A	N/A	Measure
Keithly 36150	2	beta, gamma	0-20R/hr	50mg/Cm <sup>2</sup>	Measure

### CALIBRATION OF SURVEY INSTRUMENTS

1. Survey instruments will be calibrated at least annually and following repair.
  2. Calibration will be performed at two points on each scale. The two points will be approximately 1/3 and 2/3 of full scale. A survey instrument may be considered properly calibrated when the instrument readings are within  $\pm 10\%$  of the calculated or known values for each point checked. Readings with  $\pm 20$  are considered acceptable if a calibration chart or graph is prepared and attached to the instrument.
  3. Survey instruments will be calibrated by an annually contracted company, whose procedures and sources are approved by the agreement state/NRC.
-

to be worn during non-duty hours or when the individual is examined in medical or dental clinics.

5-5. BIOASSAY.

a. The HPO will designate individuals to participate in the bioassay program. Once so designated, individuals will participate until released, in writing, by the HPO.

b. Individual Responsibilities.

(1) Appearing for measurement at the time, place and frequency required.

(2) Providing required specimen for in-vitro counting.

(3) Informing HPO of changes in working conditions or other factors influencing the type or frequency of bioassay measurement.

5-6. RECORDS.

a. Records of individual radiation exposure are maintained on DD Form 1141, "Record of Occupational Exposure to Ionizing Radiation", or an Automated Dosimetry Report (ADR). The records are kept at the HPO until individuals depart WRAMC or are removed from dosimetry service. Records are then placed in the individual health record. Records may be reviewed at the HPO during normal duty hours.

b. Locator Cards.

(1) DD Forms 1141 or ADR are medical records. Locator cards identifying radiation workers will be furnished by HPO to the medical records section for placement in individual medical records.

(2) Individuals not maintaining medical records at the out-patient medical records section, WRAMC, must bring their records to the HPO to have the locator card inserted.

c. Personnel occupationally exposed at a facility outside the jurisdiction of WRAMC will furnish all exposure information to the HPO.

d. The DD Form 1141 or ADR is covered under the Privacy Act. Therefore a written authorization, signed by the individual must be forwarded to the HPO before occupational exposure information can be released.

5-7. TERMINATION OF PERSONNEL DOSIMETRY. Individuals who wish to terminate personnel dosimetry service for any reason will report to the HPO, Building 188, Forest Glen Section with their medical records during normal duty hours. The individual must provide HPO with the reason for termination and a forwarding address.

radioisotopes and protection of individuals from external and internal radiation hazards. It is required that all radiation workers attend this course, as soon as possible, after beginning work at WRAMC. An examination is given at the end of this course. If the student fails the exam it may be retaken, after additional preparation, or the student may elect to retake the course. Subsequent failure requires that the Principal User evaluate the advisability of retaining the individual in a position which requires the handling and use of radioisotopes.

c. Principal User Classes. The senior staff of the HPO conducts periodic classes on selected topics. These topics are based on the need to disseminate current information on license and regulation changes, to correct deficiencies which have been noted and to enhance the professional competency of individuals working in radiation environments. This is mandatory for Principal Users. Co-workers are encouraged to attend.

d. Nursing In-service: Briefings, designed for nursing and para-professional staff who come in contact with patients undergoing therapy with radioisotopes, are presented upon request to the HPO. Specific details on the types of therapy or other procedures are covered.

e. Briefing for Support Personnel: This class is designed for individuals whose duties take them into areas where radioisotopes are used. It familiarizes personnel with signs, placards and color schemes associated with radioactive material, gives a general outline of what radiation and contamination are and sets ground rules for what should and should not be done in these areas.

f. Briefing for Firefighters: This briefing covers methods of designating areas where radioactive materials are used, use of radiation detection instrumentation, notification procedures and procedures for ensuring protection from contamination and internal deposition.

g. Briefing for Military Police/Security Personnel: This class teaches the proper method for receiving, inspecting and storing incoming packages containing radioisotopes and addresses the procedures for dealing with problems such as a damaged container or leaking package.

DATE 11/15/89

TELEPHONE OR VERBAL CONVERSATION RECORD

TIME 10:30  A.M.  P.M.

INCOMING CALL

OUTGOING CALL

VISIT

PERSON CALLING

TK Thompson

OFFICE/ADDRESS

RI

PHONE NUMBER

EXTENSION

5303

PERSON CALLED

David Burton

OFFICE/ADDRESS

Ami  
030-66895

PHONE NUMBER

EXTENSION

~~030~~ 427-5104

CONVERSATION

SUBJECT

Amend Request dated 10/13/89

SUMMARY

- 1) Will new irradiator be kept in a locked area when unattended?
  - 2) User Training, dosimetry, use of instruments refers to License 02. We must please submit these references or refer to references already submitted under the 03 license.
  - 3) What ~~training~~ experience does the proposed RSO have with self shielded irradiators?
- Mr. Burton agreed to answer these questions + Fax to Region.

REFERRED TO:

ACTION REQUESTED

Fax to Region

ADVISE ME OF ACTION TAKEN.

INITIALS

DATE

ACTION TAKEN

INITIALS

DATE

030-06895



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



REPLY TO  
ATTENTION OF

November 2, 1989

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 08-01738-03, Walter Reed Army Medical  
Center, Washington, District of Columbia.

Recommend approval.

Sincerely,

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

Enclosure

VE EXEMPT

95 03 9- 121 68.

OFFICIAL RECORD COPY ML 10

111556  
NOV 06 1989



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

REPLY TO  
ATTENTION OF:

16 OCT 1989

HSCL-H-HP (385-11m)

MEMORANDUM THRU Commander, US Army Health Services Command, ATTN: HSCL-P,  
Fort Sam Houston, TX 78234-6000

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

SUBJECT: Amendment of US Nuclear Regulatory Commission License No. 08-01738-03

1. Request that NRC License No. 08-01738-03 for Walter Reed Army Medical Center be amended to include another Gamma Irradiator; an NRC Form 313 and other pertinent documents are provided (enclosure 3 thru 7).
2. This unit is a critical part of a new bone marrow transplant program coming on line at Walter Reed, we therefore request your assistance in the expeditious processing of this amendment.
3. Please be advised that Major General Richard D. Cameron is the new Commanding Officer of Walter Reed Army Medical Center and Colonel Russ Zajtchuk is the new Deputy Commander for Clinical Services and in that capacity is the new Chairman of the Radiation Control Committee of Walter Reed Army Medical Center. Copies of their curriculum vitae are provided (enclosure 1 & 2).

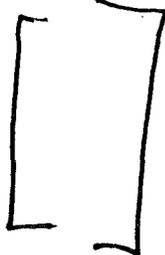
FOR THE COMMANDER:

7 Encls

  
LLEWELLYN E. PIPER  
LTC, MS  
Executive Officer

BIOGRAPHICAL INFORMATION

RICHARD D. CAMERON, M.D., MAJOR GENERAL, USA.

Education:	BA Degree, State University of Iowa	
	MD Degree, State University of Iowa	
	MHA Degree, Baylor University, Texas	
Internship:	Rotating Internship, Brooke Army Medical Center, San Antonio, Texas,	1965-66
Residency:	Psychiatric Residency, Letterman Army Medical Center, San Francisco, California, (with work at Center for Training in Community Psychiatry, Berkeley.	1966-69
Positions:	Commanding Officer, 93d (KO) Neuro-psychiatric Team, RVN,	1969
	Division Psychiatrist, 1st Air Cavalry Divison, RVN,	1970
	Instructor, Behavioral Sciences Divison, Academy of Health Sciences, US Army, Fort Sam Houston, Texas,	1971
	Instructor, US Army Alcohol and Drug Prevention Program, Yale University, FRG	1972
	Project Officer, Deputy Chief of Staff for Professional Activities, HQ, US Army Health Services Command, San Antonio, Texas,	1974
	Chief, Inpatient Psychiatric Service, William Beaumont Army Medical Center, El Paso, Texas,	1974
	Chief, Department of Psychiatry, William Beaumont Army Medical Center, El Paso, Texas,	1974-75
	Chief, Department of Psychiatry, Landstuhl Army Medical Center, 2d General Hospital, FRG	1975-76

Ex 6

Positions (continued)	Divison Surgeon, 3d Armored Division, Frankfurt, FRG,	1976-77
	Commander, 56th General Hospital, Baumholder FRG	1977-79
	Medical Team Chief-Saudi Arabian National Guard Medical Moderniza- tion Program,	1980
	Deputy Chief of Staff, Operations, HQ, US Army Health Services Command, Fort Sam Houston, Texas,	1980-1983
	Commander, Darnall Army Community Hospital and III Corps Surgeon, Fort Hood, Texas,	1983-86
	Commanding General, William Beaumont Army Medical Center, El Paso, Texas,	1986-88
	Deputy Assistant Secretary of Defense for Health and Medicine, Washington, D. C.,	1988-89
Current Position:	Commanding General Walter Reed Army Medical Center Washington, D. C.,	1989-
Certificate of License:	Medicine and Surgery, Iowa,	1965
Professional Boards:	Diplomate, American Board of Psychiatry and Neurology,	1973
Professional Societies:	American College of Physician Executives American Psychiatric Associaton Association of Military Surgeons	
Awards:	Legion of Merit (2) Meritorious Service Medal Air Medal Army Commendation Medal (5) Expert Field Medical Badge Parachutist Badge US Army Order of Military Merit	
Military Schooling:	AMEDD Officers' Basic AMEDD Officers' Advanced Command and General Staff College US Army-Baylor Hospital Administration Course Industrial College of the Armed Forces.	

CURRICULUM VITAE

NAME: Russ Zajtchuk

CURRENT STATUS: Colonel, Medical Corps, U. S. Army (Active, Regular)  
SSI#: 61K9A, 61J9B  
Date of Rank: 7 June 1978  
SSN: [ ]

Deputy Commander for Clinical Services  
Walter Reed Army Medical Center  
Washington, DC 20307-5001

Professor and Chairman  
Division of Cardiothoracic Surgery  
Uniformed Services University of the Health Sciences  
Bethesda, MD 20814

Consultant, Cardiothoracic Surgery  
National Naval Medical Center  
Bethesda, MD 20814

BOARD CERTIFICATION AND LICENSURE: American Board of Surgery, 1969  
American Board of Thoracic Surgery, 1970  
Licensed: Colorado and Illinois (current and fully active)

EDUCATION: College: University of Illinois, 1955-1958  
University of Chicago, 1958-1959

Medical School: University of Chicago, 1959-1963  
Degrees: BS [ ] MD [ ]

Internship: University of Chicago, 1963-1964

General Surgery Residency: University of Chicago, 1964-1968

Cardiothoracic Residency: University of Chicago, 1968-1970

PROFESSIONAL EXPERIENCE AND ASSIGNMENTS: University of Chicago, Assistant Professor of Surgery, Jan 1970 - Jul 1970

Chief, Thoracic Surgery, Fort Campbell, Kentucky, 1970-1971

Tour in Vietnam. Served as Chief, Professional Services at 24th Evac Hospital and 3rd Field Hospital. Also served as Consultant in Thoracic Surgery for Vietnam, Sep 1971 - Sep 1972

EX 6

**PROFESSIONAL  
EXPERIENCE AND**

**ASSIGNMENTS (CONT'D):**

Assistant Chief, Thoracic-Cardiovascular Surgery Service, Fitzsimons Army Medical Center, Denver, CO, 1972-1977

Director of Surgical Research, Fitzsimons Army Medical Center, Denver, CO, 1972-1977

Assistant Professor of Surgery, University of Colorado School of Medicine, 1972-1976

Assistant Chief, Thoracic-Cardiovascular Surgery Service, Walter Reed Army Medical Center, Washington, DC, 1980-1981

Chairman and Program Director, National Naval Medical Center, Bethesda, MD, 1980-1981

Chairman and Program Director, Thoracic-Cardiovascular Surgery Service, Walter Reed Army Medical Center, Washington, DC, 1981-1984

Professor and Chairman, Division of Cardiothoracic Surgery, School of Medicine, Uniformed Services University of the Health Sciences, Bethesda, MD, 1981 - Present

Consultant to The Army Surgeon General in Cardiac and Thoracic Surgery, Washington, DC, 1980-1984

Commander, 41st Combat Support Hospital and JTF Surgeon for Honduras, Jul 1983 - Apr 1984

Department of Defense Readiness Review Member for Secretary of Defense, Apr 1984 - Jun 1984

United States Southern Command, Command Surgeon, Quarry Heights, Panama, Jul 1984 - Jul 1985

Student at National Defense University, Aug 1985 - Jun 1986

Surgical Consultant to The Surgeon General, Chief Consultants Division, Jul 1986 - Jul 1988

Deputy Director, Professional Services, Office of The Surgeon General, Jun 1988 - Jun 1989

Chief, Consultants Division, Office of The Surgeon General, Jun 1987 - Jun 1989

**MILITARY  
SCHOOLS/COURSES:**

AMEDD Officer Basic, 1970  
AMEDD Officer, Advanced, 1978  
Combat Casualty Course (AMEDD), 1982  
USA Command and General Staff College, 1983  
Baylor University Program in Health Care  
Administration, 1986  
Industrial College of the Armed Forces, 1986

**SOCIETIES:**

American College of Surgeons  
Association of Military Surgeons  
Society for Thoracic Surgeons  
Sigma Xi  
The Western Thoracic Surgical Society  
American Association for Thoracic Surgery  
American College of Cardiology  
Association of Training Program Directors

**CIVILIAN  
AWARDS/HONORS:**

NSF Fellowship, 1961 - 1962  
Chicago Surgical Society Award for Surgical  
Research, 1965 (1st Prize)  
Certificate of Merit from AMA for Exhibit on Hyper-  
coagulability, 1976  
Won Second Place at Southeastern Surgical Congress,  
Exhibit on Hypercoagulability, 1977  
Dominique Larey Award for Excellence in Military  
Surgery, Awarded by USUHS, 1989

**MILITARY AWARDS -  
U.S.:**

Department of Defense Superior Service Medal  
Legion of Merit with Oak Leaf Cluster (One from the  
Air Force)  
Bronze Star  
Department of Defense Meritorious Service Medal

**MILITARY AWARDS -  
U.S.: (CONT'D)**

Meritorious Service Medal with Two Oak Leaf Clusters  
(One from the Navy)

Department of Defense Commendation Medal

Army Commendation Medal with Oak Leaf Cluster

Army Achievement Medal

Humanitarian Assistance Medal

**MILITARY AWARDS -  
FOREIGN**

Vietnamese Cross of Gallantry

Vietnamese Civic Action Medal

Honduran Merit Medal, First Class

**MILITARY PROFES-  
SIONAL AWARD:**

Awarded "A Prefix" by The Surgeon General for Out-  
standing Performance in Cardiothoracic Surgery

**PUBLICATIONS:**

Dawson, D., Allen, J.G., and Zajtchuk, R.: Mono-  
alkylating Agents as therapeutic agents in plasma  
sterilization and plasma protein stabilization. J.  
Surg Res., 2:31-35, 1962.

Dawson, D., Zajtchuk, R., and Allen, J.G.: Use of  
chemotherapeutic agents for possible bacterial and  
viral contamination of blood. J. Surg. Res., 3:97-  
100, 1963.

Dawson, D. and Zajtchuk, R.: Effect of rapid  
rewarming on tissue survival after deep freezing  
injury. Research and proceedings of the Institute  
of Medicine Bulletin (Chicago), Mar, 1963.

Dawson, D., Zajtchuk, R., and Allen, J.G.:  
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chemotherapeutics in viral disease transmitted by  
blood transfusions. J. Surg. Res., 4:47-53, 1964.

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and formaldehyde as plasma additives in instability  
heat denaturation of plasma proteins. J. Clin.  
Chem., 10:793-799, 1964.

Kahan, B.D., Zajtchuk, R., Dawson, D., and Adams,  
W.G.: The kinetics of sensitization with whole and  
fractionated mouse spleen cells. Dig. Chest, 46:452-  
456, 1964.

PUBLICATIONS:  
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Gago, O., Zajtchuk, R., Nigro, S., and Adams, W.E.: Canine pulmonary homografts with uncontrolled cross-circulation. *J. Thor. Cardiovasc. Surg.*, 50:775-780, 1965.

Adams, W.G., Gago, O., and Zajtchuk, R.: Use of azathioprine in homotransplantation of pulmonary tissue. *Bull. Soc. Int. Chi.*, 25:631-638, 1966.

Block, G.E., Evans, R., and Zajtchuk, R.: Splenectomy for idiopathic thrombocytopenic purpura. *Arch. Surg.*, 92:434-489, 1966.

Zajtchuk, R., Ake, V., Hamouda, I., Moulder, P.V., and Adams, W.E.: Maintenance of the circulation in cardiac asystole by the mechanical pulsator. *Trans. Amer. Soc. Artif. Intern. Organs*, Vol. XII, 1966.

Zajtchuk, R., Kahan, B.D., and Adams, W.E.: The tissue distribution of a water soluble transplantation antigen. *Dis. Chest*, 50:368-371, 1966.

Evans, R., Zajtchuk, R., and Menguy, R.: Role of vagotomy and gastric drainage in the surgical treatment of duodenal ulcer (Result of 10-year experience at the University of Chicago Hospitals). *Surg. Clin. N. Amer.*, 47:141-146, 1967.

Zajtchuk, R., Gago, O., and Adams, W.E.: Homotransplantation of the lung (influence of quantity of antigen on the survival of the graft). *J. Thor. Cardiovasc. Surg.*, 53:109-115, 1967.

Zajtchuk, R., Amato, J., Paloyan, E., and Baker, R.: Inhibition of external pancreatic secretion by glucagon. *Surg. Forum*, 18:410-411, 1967.

Zajtchuk, R., Mamouda, F., Moulder, P.V., and Adams, W.E.: Maintenance of Circulation in cardiac asystole by the mechanical pulsator. *Dis Chest*, 1967.

Bauer, R.J., Bass, R.T., Zajtchuk, R., and Strohl, E.L.: External pancreatic fistula following abdominal injury. *Arch. Surg.*, 95:556-566, 1967.

Zajtchuk, R. and Baker, R.: Effects of hypoglycemia on external pancreatic secretion. *J. Trauma*, 9:629-637, 1969.

PUBLICATIONS:  
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Menguy, R., Gadacz, R., and Zajtchuk, R.: Surgical management of acute gastric mucosal bleeding. Arch. Surg., 99:198-208, 1969.

Zajtchuk, R., Yacoub, M.H., and Kittle, C.F.: Spontaneous A-V fistula between common iliac vessels. Surgery, 69:194-200, Feb 1971.

Geis, P., Johnson, C.F., Zajtchuk, R., and Kittle, C.F.: Extrapericardial (mediastinal) cardiac tamponade. Arch. Surg., 100:305-306, 1970.

Daily, R., Ranniger, K., Zajtchuk, R., Evans, R., and Moulder, P.V.: Serum and plasma infusion in human pulmonary artery: Embolic implications. Arch. Surg., 101:26-31, Jul, 1970.

Baker, R.J., Zajtchuk, R., and Shoemaker, W.C., et al: Physiologic studies on external pancreatic secretion in man. Bull. Soc. Int. Chir., 27:81-88, 1968.

Zajtchuk, R., Resnekor, L., Ranniger, K., and Gonzales-Lavin, L.: Traumatic aorta to pulmonary artery fistula. Thoracic, 26(2):219, 1971.

Gonzales-Lavin, L. and Zajtchuk, R.: Surgical considerations in the treatment of acute acquired ventricular septal defect. Thorax, 26:610-614, Sep 1971.

Zajtchuk, R., Gonzales-Lavin, L., and Replogle, R.: Pulmonary artery aneurysm associated with ASD and absent pulmonary valve. J. Thorac. Cardiovasc. Surg. 65:699-701, May 1973.

Zajtchuk, R., Strevey, T., Heydorn, W., and Treasure, R.: Mediastinal histoplasmosis: Surgical considerations. J. Thorac. Cardiovasc. Surg., 66:300-304, Aug 1973.

Zajtchuk, R., Guiton, C.R., Sadler, T.R., Heydorn, W.H., and Strevey, T.E.: Surgical treatment of pulmonary melioidosis. J. Thorac. Cardiovasc. Surg., 66:838, Nov 1973.

Heydorn, W.H., Barry, M.J., Zajtchuk, R., and Strevey, T.W.: Tumor embolus death during pneumonectomy. J. Thorac. Cardiovasc. Surg., 67:308-309, Feb 1974.

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Zajtchuk, R., Fitterer, J., Strevey, T.E., and Nelson, W.P.: Bilateral atrial myxoma (Preoperative diagnosis and successful removal). J. Thorac. Cardiovasc. Surg., 69:291-294, Feb 1975.

Zajtchuk, R., Seyfer, A.E., and Strevey, T.E.: Use of intercostal muscle in primary repair of esophageal atresia with tracheoesophageal fistula. Ann. Thorac. Surg., 19:239-241, Mar 1975.

Zajtchuk, R., Corby, D.B., Miller, J.G., and O'Barr, T.P.: Treatment of digoxin toxicity with activated charcoal. Am. J. Cardiol. 35:178, Jan 1975.

Collins, G.J. and Zajtchuk, R.: Hypercoagulability in mesenteric venous occlusion: Report of two cases. Am. J. of Surg., 132(3):390-391, Sep 1976.

Collins, G.J., and Zajtchuk, R.: Hypercoagulability in patients with peripheral vascular disease. Am. J. Surg., 13c(1):2-6, Jul 1975.

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Heydorn, W.H., and Zajtchuk, R., et al: Surgical management of pectus deformity. Ann. Thorac. Surg., 23(5):417-420, May 1977.

Zajtchuk, R., and Collins, G.J., et al: Coagulation factors influencing thrombosis of aortocoronary bypass grafts. J. Thor. Cardiovasc. Surg., 73:309, 1977.

Collins, G.J. and Zajtchuk, R., et al: The effects of operative stress on the coagulation profile. Am. J. of Surg., 133:612, May 1977.

Seyfer, A.E. and Zajtchuk, R.: A clinical analysis of Ewing's sarcoma of the chest wall. Military Medicine, 142(10):778-779, Oct 1977.

Heydorn, W.H. and Zajtchuk, R., et al: Gore-Tex grafts for replacement of the superior vena cava. Ann. Thorac. Surg., 23(6):539-544, Jun 1977.

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(CONT'D)

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Zajtchuk, R. and Collins, G.J.: Coagulation abnormalities in patients undergoing myocardial revascularization. J. Thorac. Cardiovasc. Surg., 75:168, 1978.

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Bowen, T.E., Zajtchuk, R., Green, D.C., and Brott, W.H.: Value of anterior mediastinotomy in bronchogenic carcinoma of the left upper lobe. J. Thorac. Cardiovasc. Surg., 76:269, 1978.

Zajtchuk, R., Seyfer, A.E., et al: Intrathoracic ganglioneuroblastoma. J. Thorac. Cardiovasc. Surg., 80(4):605-612, Oct 1980.

Chun, P., Leebug, W.T., Coggin, J.T., and Zajtchuk, R.: Primary pericardial malignant epithelioid mesothelioma. Chest, 77, 558-561, Apr 1980.

Zajtchuk, R., Bowen, T.E., Albus, R.A., and Brott, W.H.: Surgical treatment of left main equivalent coronary artery disease. J. Thorac. Cardiovasc. Surg., 78(3):452-454, Sep 1979.

Bowen, T.E. and Zajtchuk, R.: Isolated mitral valve replacement with Kay Shiley disc valve (long-term followup). J. Thorac. Cardiovasc. Surg., 80(1):45-49, Jul 1980.

Graeber, G.M., Synder, T.R., Zajtchuk, R., and Brott, W.H.: A comparison of serum isoenzyme levels of creatinine phosphokinase and lactic dehydrogenase in patients undergoing thoracic operations and patients admitted to coronary care unit. Ann. of Thorac. Surg., 30(4):364-369, Oct 1980.

Bowen, T.E., Brott, W.H., Green, D., Zajtchuk, R.: Coarctation of the aorta with left aortic arch and right descending aorta: Case report. Military Medicine, 145(2), Feb 1980.

PUBLICATIONS:  
(CONT'D)

Graeber, G.M., Zajtchuk, R., et al: An analysis of the isoenzymes of creatinine phosphokinase and lactic dehydrogenase in the esophagus. *Ann. of Thorac. Surg.*, 32(3), 230-234, Sep 1981.

Brott, W.H., Zajtchuk, R., et al: Incidence of thromboembolism in patients with Bjork-Shiley prosthesis on aspirin/dipyridamole treatment. *J. of Thorac. Cardiovasc. Surg.*, 81(4):632-635, Apr 1981.

Gibeilly, G., and Zajtchuk, R.: Diagnosis and treatment of desmoid tumors: A review. *Military Medicine*, 147(4):278-284, Apr 1982.

Bowen, T. and Zajtchuk, R.: Diaphragmatic paralysis managed by diaphragmatic replacement. *Ann. of Thorac. Surg.*, 33:184-185, Feb 1982.

Zajtchuk, R., Nelson, W.P., and Collins, G.J.: Ischemic heart disease and coronary thrombosis. Chapter 7, pp. 215-240, in *Vascular Occlusive Disorders*, Futura Publishing Company, Inc., Mount Kisco, New York, 1981.

Zajtchuk, R. and Zajtchuk, J.: Relationship of triglyceride levels to thrombosis in patients with coronary artery disease. Published in the *Ann. Thorac. Surg.* 1980.

Graeber, G., Grishkin, B., Cohen, D.J., and Zajtchuk, R.: A technique for successful replacement of the esophagus with an interposed substernal colon segment. *Contemporary Surgery*, pp. 17-26, Apr 1983.

Sherrill, P.J., Grishkin, B.A., Galal, F.S., Zajtchuk, R., and Graeber, G.M.: Radiation association malignancies of the esophagus. *Cancer*, 54:726, 1984.

Cohen, D.J., Ronningen, L.D., Graeber, G.M., Dshong, J.L., Jaffin, J. and Zajtchuk, R.: Management of patients with malignant thymoma. *J. Thorac. Cardiovasc. Surg.*, 87(2):301-307, Feb 1984.

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(CONT'D)

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Watkins, M.T., Sharefkin, J.B., Zajtchuk, R., Maciag, T.M., D'Amore, P.A., Ryan, U.S., Wart, H.V., Rich, N.M.: Adult human saphenous vein endothelial cells: Assessment of their reproductive capacity for use in endothelial seeding of vascular prostheses. J. Surg. Research 36:588-596, 1984.

Zajtchuk, R., Antopol, M.R., Graeber, G.M.: Thoracic Trauma, Medical Bulletin, 41(12):3-7, 1984.

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Cohen, D.J., Benjamin, S.B., Graeber, G.M., Zajtchuk, R., Castell, D.O., and Patrick, D.H.: Evaluation of the Agelchik Antireflux prosthesis using a model for esophageal reflux in rhesus monkeys. Ann. Thorac. Surg. 41:135-142, 1986.

Graeber, G.M. and Zajtchuk, R.: Changes in serum creatine kinase and lactic dehydrogenase caused by acute perioperative myocardial infarction and by transatrial cardiac surgical procedures. J. Thorac. Cardiovasc. Surg., 92:63-72, Jul 1986.

Fall, S.M., Burton, N.A., Graeber, G.M., Mead, M.D., Lough, F.C., Aibus, R.A., Zajtchuk, R.: Prevention of ventricular fibrillation after myocardial revascularization. Ann. Thorac. Surg. 43:182-184, Feb 1987.

Graeber, G.M. and Zajtchuk, R.: Serum creatine kinase and lactic dehydrogenase isoenzyme levels in patients after major esophageal surgery, esophageal dilatation, and acute myocardial infarction. Ann. Thorac. Surg., 43:279-284, Mar 1987.

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PRESENTATIONS:

Soluble Transplantation Antigen. Presented at Chicago Surgical Society Meeting in 1965. (Awarded prize for best surgical research in 1965.)

Maintenance of Circulation with a Mechanical Cardiac Pulsator. Presented at the Meeting of the American Society for Artificial Organs in 1966.

Maintenance of Circulation with a Mechanical Cardiac Pulsator. Presented at 32nd Annual Meeting of American College of Chest Physicians, June 1966. (Received certificate of merit)

Inhibition of External Pancreatic Secretion by Glucagon. Presented at Surgical Forum in 1967.

Treatment of Digoxin Toxicity with Activated Charcoal. Presented at the 24th Annual Scientific Session of American College of Cardiology, 1974.

Measurement of Heart Valve Cross Section Area by Electrical Impedance. Presented at Biomedical Engineering Society, Apr 1975.

Coagulation Abnormalities in Patients Undergoing Myocardial Revascularization. Presented at Seminar on Thrombosis Research, May 1977, Walter Reed Army Medical Center.

Coagulation Abnormalities in Patients Undergoing Myocardial Revascularization. Presented at Samson Thoracic Society, Jun 1977.

Use of Intra-Aortic Balloon in Left Main Coronary Artery Lesions. Presented at the Army Cardiology Meeting, May 1978.

PRESENTATIONS:  
(CONT'D)

Surgical Treatment of Left Main and Left Main Equivalent Coronary Artery Disease. Presented at University of Chicago, Jun 1978.

Left Ventricular to Aortic Stenosis. Presented at Cardiology Symposium, Madigan Army Medical Center, May 1979.

Asymptomatic Left Main Coronary Artery Disease (Clinical Profile). Presented at Military Cardiology Meeting, San Francisco, May 1980.

A Comparison of Serum Isoenzyme Levels of CPK and LDH in Patients Undergoing Thoracic Operations and Patients Admitted to Coronary Care Unit. Presented at Thoracic Surgery Society Meeting, Jan 1980.

Symposium Director for "The First Annual USUHS Cardiothoracic Surgery Symposium". Presented at Uniformed Services University of the Health Sciences, Bethesda, MD, Oct 1982.

Cardiac Trauma. Presented at the Hospital of the University of Pennsylvania, Nov 1982.

Evaluation of the Angelchik Antireflux Prosthesis using a Model for Esophageal Reflux in Rhesus Monkeys. Presented at the Southwestern Surgical Congress, 36th Annual Meeting, Hawaii, Apr 1984.

Preventing Ventricular Fibrillation after Aortic Cross Clamping. Presented at the Army Cardiology Meeting, Apr 1984.

The Use of Computerized Tomography (CT) in the Evaluation of Mediastinal Masses. Presented at the Western Thoracic Surgical Association, Jun 1985.

Results of Coronary Artery Bypass Grafting in Young Patients. Presented at the American College of Chest Physicians, 1985.

Central America - An Overview with Emphasis on Honduras. Presented at 22nd Medical Symposium of the 94th U.S. Army Reserve Command, October 1988.

MOVIES:

Apical Left Ventricular Aortic Bypass - A Method for Relief of Left Ventricular Outflow Obstruction (Presented at the Annual Meeting of the Society of Thoracic Surgeons, Los Angeles, CA, Jan 1981.

MOVIES:  
(CONT'D)

Resection of Giant Cell Tumor Involving the Clavicle and Chest Wall. (Presented at the Annual Meeting of the Society of Thoracic Surgeons, San Francisco, CA, Jan 1983).

Surgical Management of Sinus of Valsalva Fistula. Presented at American College of Surgery, 1984.

SCIENTIFIC  
EXHIBITS:

Hyercoagulability - Importance in Surgical Practice. (Won Second Place at Southeastern Surgical Congress, Apr 1977).

Different Techniques for Replacing the Esophagus with Interposed Colon. (Presented at the 68th Annual Clinical Congress of the American College of Surgeons, Chicago, IL, Oct 1982).

The Use of Muscle and Musculo-Cutaneous Flaps for Reconstruction of Thoracic Defects. (Presented at the 68th Annual Clinical Congress of the American College of Surgeons, Chicago, IL, Oct 1982).

Medicine in Low Intensity Conflict (Presented at AMSUS, 1987).

Surgical Treatment of Snake Bites (Presented at AMSUS, 1987).

Management of Primary Cardiac Tumors. Displayed at The 69th Clinical Congress of the American College of Surgeons, 1983 and the 33rd Scientific Session of American College of Cardiology, 1984.

BOOKS:

Senior Editor of 18 Volume Series on Military Medicine.

## APPLICATION FOR MATERIAL LICENSE

**INSTRUCTIONS: SEE THE APPROPRIATE LICENSE APPLICATION GUIDE FOR DETAILED INSTRUCTIONS FOR COMPLETING APPLICATION. SEND TWO COPIES OF THE ENTIRE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW.**

**FEDERAL AGENCIES FILE APPLICATIONS WITH:**

U.S. NUCLEAR REGULATORY COMMISSION  
 DIVISION OF FUEL CYCLE AND MATERIAL SAFETY, NMSS  
 WASHINGTON, DC 20555

**ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS, IF YOU ARE LOCATED IN:**

CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, MAINE, MARYLAND,  
 MASSACHUSETTS, NEW JERSEY, NEW YORK, PENNSYLVANIA, RHODE ISLAND,  
 OR VERMONT, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION I  
 NUCLEAR MATERIAL SECTION B  
 831 PARK AVENUE  
 KING OF PRUSSIA, PA 19406

ALABAMA, FLORIDA, GEORGIA, KENTUCKY, MISSISSIPPI, NORTH CAROLINA,  
 PUERTO RICO, SOUTH CAROLINA, TENNESSEE, VIRGINIA, VIRGIN ISLANDS, OR  
 WEST VIRGINIA, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION II  
 MATERIAL RADIATION PROTECTION SECTION  
 101 MARIETTA STREET, SUITE 2900  
 ATLANTA, GA 30323

**IF YOU ARE LOCATED IN:**

ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR  
 WISCONSIN, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION III  
 MATERIALS LICENSING SECTION  
 799 ROOSEVELT ROAD  
 GLEN ELLYN, IL 60137

ARKANSAS, COLORADO, IDAHO, KANSAS, LOUISIANA, MONTANA, NEBRASKA,  
 NEW MEXICO, NORTH DAKOTA, OKLAHOMA, SOUTH DAKOTA, TEXAS, UTAH,  
 OR WYOMING, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION IV  
 MATERIAL RADIATION PROTECTION SECTION  
 611 RYAN PLAZA DRIVE, SUITE 1000  
 ARLINGTON, TX 76011

ALASKA, ARIZONA, CALIFORNIA, HAWAII, NEVADA, OREGON, WASHINGTON,  
 AND U.S. TERRITORIES AND POSSESSIONS IN THE PACIFIC, SEND APPLICATIONS  
 TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION V  
 MATERIAL RADIATION PROTECTION SECTION  
 1480 MARIA LANE, SUITE 210  
 WALNUT CREEK, CA 94695

**PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSED MATERIAL IN STATES SUBJECT TO U.S. NUCLEAR REGULATORY COMMISSION JURISDICTION.**

<p>1. THIS IS AN APPLICATION FOR (Check appropriate item)</p> <p><input type="checkbox"/> A. NEW LICENSE</p> <p><input checked="" type="checkbox"/> B. AMENDMENT TO LICENSE NUMBER <u>08-01738-03</u></p> <p><input type="checkbox"/> C. RENEWAL OF LICENSE NUMBER _____</p>	<p>2. NAME AND MAILING ADDRESS OF APPLICANT (Include Zip Code)</p> <p>Department of the Army          Walter Reed Army Medical Center          ATTN: HSHL-H-HP          Washington, DC 20307-5001</p>
--	---

3. ADDRESS(ES) WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED.

No Change

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION <b>PETER H. MYERS, LTC, MS, Health Physics Officer, WRAMC</b>	TELEPHONE NUMBER <b>(301) 427-5104</b>
---	---

SUBMIT ITEMS 5 THROUGH 11 ON 8 1/2 x 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.

5. RADIOACTIVE MATERIAL <small>a. Element and mass number, b. chemical and/or physical form, and c. maximum amount which will be possessed at any one time.</small>	6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.
7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING AND EXPERIENCE.	8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.
9. FACILITIES AND EQUIPMENT.	10. RADIATION SAFETY PROGRAM.
11. WASTE MANAGEMENT.	12. LICENSEE FEES (See 10 CFR 170 and Section 170.31) FEE CATEGORY <b>7B</b> AMOUNT <b>Exception (10CFR ENCLOSED \$ 170.11(a)(5))</b>

3. CERTIFICATION. (Must be completed by applicant) THE APPLICANT UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BINDING UPON THE APPLICANT. THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT, NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PARTS 30, 32, 33, 34, 35, AND 40 AND THAT ALL INFORMATION CONTAINED HEREIN, IS TRUE AND CORRECT TO THE BEST OF THEIR KNOWLEDGE AND BELIEF.

WARNING: 18 U.S.C. SECTION 1001 ACT OF JUNE 25, 1948, 62 STAT. 749 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

SIGNATURE—CERTIFYING OFFICER 	TYPED/PRINTED NAME <b>LLEWELLYN E. PIPER, LTC, MS</b>	TITLE <b>Executive Officer</b>	DATE <b>13 OCT 84</b>
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14. VOLUNTARY ECONOMIC DATA											
a. ANNUAL RECEIPTS <table style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 25%;"><input type="checkbox"/> &lt;\$250K</td><td style="width: 25%;"><input type="checkbox"/> \$1M-3.5M</td></tr> <tr><td><input type="checkbox"/> \$250K-500K</td><td><input type="checkbox"/> \$3.5M-7M</td></tr> <tr><td><input type="checkbox"/> \$500K-750K</td><td><input type="checkbox"/> \$7M-10M</td></tr> <tr><td><input type="checkbox"/> \$750K-1M</td><td><input type="checkbox"/> &gt;\$10M</td></tr> </table>	<input type="checkbox"/> <\$250K	<input type="checkbox"/> \$1M-3.5M	<input type="checkbox"/> \$250K-500K	<input type="checkbox"/> \$3.5M-7M	<input type="checkbox"/> \$500K-750K	<input type="checkbox"/> \$7M-10M	<input type="checkbox"/> \$750K-1M	<input type="checkbox"/> >\$10M	b. NUMBER OF EMPLOYEES (Total for entire facility excluding outside contractors)	d. WOULD YOU BE WILLING TO FURNISH COST INFORMATION (Dollar and/or staff hours) ON THE ECONOMIC IMPACT OF CURRENT NRC REGULATIONS OR ANY FUTURE PROPOSED NRC REGULATIONS THAT MAY AFFECT YOU? (NRC regulations permit it to protect confidential commercial or financial—proprietary—information furnished to the agency in confidence)	
<input type="checkbox"/> <\$250K	<input type="checkbox"/> \$1M-3.5M										
<input type="checkbox"/> \$250K-500K	<input type="checkbox"/> \$3.5M-7M										
<input type="checkbox"/> \$500K-750K	<input type="checkbox"/> \$7M-10M										
<input type="checkbox"/> \$750K-1M	<input type="checkbox"/> >\$10M										
		c. NUMBER OF BEDS	<input type="checkbox"/> YES <input type="checkbox"/> NO								

FOR NRC USE ONLY				
TYPE OF FEE	FEE LOG	FEE CATEGORY	COMMENTS	APPROVED BY
AMOUNT RECEIVED	CHECK NUMBER		ALL EXEMPT	DATE

CONTINUATION OF NRC FORM 313 (Items 5 - 11)

5. Radioactive material:

- a. Cesium 137
- b. Sealed source

c.  curies.

maximum total curie amount:

6. Purpose: Irradiation of blood products for transfusion, to kill lymphocytes in blood products and to prevent Graft versus Host disease.

7. Please add Lieutenant Allen W. Anthony to the license as the Radiation Protection Officer. Lieutenant Anthony has served at Walter Reed as the Assistant Health Physics Officer since January 1988. Lieutenant Anthony will replace Major Gerald M. Connock as the RPO on the License on 28 September 1989 as Major Connock is being transferred. A copy of his curriculum vitae is provided (enclosure 4) also reference amendment of NRC Materials License - Medical, No. 08-01738-02, 27 July 1989 and 17 September 1989.

8. Training: No Change - reference application for renewal of NRC Material License - Medical, No. 08-01738-02, 8 May 1987, Tab C chapter 2.

9. Facilities and equipment:

a. The  irradiator will be located on the  in  of building 2, Walter Reed Army Medical Center. The room is bordered on one side by a corridor with no direct access to the room, on two sides by controlled access storage rooms , and on the fourth side by an infrequently used controlled access hallway. The storage rooms will have intermittent occupancy by no more than two (2) employees per room. The overhead area is a controlled access interstitial space for piping and ventilation systems and would be occupied in case of repairs. A diagram of room  and surrounding areas is attached (enclosures 5 & 6). Room  is equipped with an automatically operated fire detection and control system (sprinkler) that is adequate to ensure the integrity of the irradiator and source in a fire.

10. Radiation safety program:

a. Personnel monitoring equipment - No Change, reference application for renewal of NRC Materials License - Medical, No. 08-01738-02, 8 May 1987, Tab C chapter 5 and Tab D condition number 1.

b. Radiation detection instruments - No Change, reference application for renewal of NRC Materials License, No. 08-01738-02, 8 May 1987, Tabs E and F.

c. Operating and emergency procedures - see enclosure 7.

d. Plans for installation and certain repairs - these tasks are to be performed by the supplier.

11. Waste management: No Change.

Ex 2

CURRICULUM VITAE

for

ALLEN W. ANTHONY

Date & Place of Birth:

Home Address:

Home Telephone Number:

Office Address:

Health Physics Office  
Walter Reed Army Medical Center  
Washington, DC 20307-5001

Office Telephone Number:

(301) 427-5104

Degrees:

B.S. - Education (Biology)  
University of Nebraska  
Lincoln, NE 68508

A.S. - X-ray Technology  
St. Philip's College  
San Antonio, TX

A.S. - Nuclear Medicine Technology  
George Washington University  
Washington, DC 20037

Certification:

American Registry of Radiologic Technologists  
(X-Ray and Nuclear Medicine)

Other Education and Training:

1989

Laser and Microwave Hazards Workshop  
US Army Environmental Hygiene Agency  
Aberdeen Proving Ground, MD

1988

Introduction to Nuclear Medicine and  
Radiation Therapy Course  
George Washington University  
Washington, DC 20037

EX 6

ANTHONY, Allen W. (Continuation of Curriculum Vitae)

1988 AMEDD Radiation Protection Officers Workshop  
US Army Environmental Hygiene Agency  
Aberdeen Proving Ground, MD

1988 Radiation Service Organization, Inc. Course  
US Army Environmental Hygiene Agency  
Aberdeen Proving Ground, MD

1988 Medical Effects of Nuclear Weapons Course  
Armed Forces Radiobiology Research Institute  
Bethesda, MD

1988 US Army Medical X-Ray Survey Techniques Course  
Academy of Health Sciences, US Army  
Fort Sam Houston, TX

1988 AMEDD Officer Basic Course  
Academy of Health Sciences, US Army  
Fort Sam Houston, TX

Chronological Experience:

Feb 1988 - Present Walter Reed Army Med. Ctr.  
Washington, DC 20307  
Assistant Health Physics Officer  
Health Physics Office

Supervise personnel in conduct of radiation protection surveys for radioisotope laboratories x-ray units, radiotherapy procedures, emergency response, and shielding evaluations.

Oct 1987 - Jan 1988 Academy of Health Sciences, US Army  
Fort Sam Houston, TX  
Student  
AMEDD Officer Basic Course

Sep 1986 - Sep 1987 USA MEDDAC  
Fort Bragg, NC  
Nuclear Medicine Technologist  
Nuclear Medicine Service

Nov 1985 - July 1986 Madigan Army Medical Center  
Fort Lewis, WA  
Student (Phase II)  
Nuclear Medicine Service

ANTHONY, Allen W. (Continuation of Curriculum Vitae)

Jun 1985 - Oct 1985

Naval School of Health Sciences  
Bethesda, MD  
Student (Phase I)  
Nuclear Medicine Technology Course

Jan 1983 - May 1985

97th General Hospital  
Frankfurt, West Germany  
X-Ray & C.T. Technologist  
Radiology Department

Oct 1982 - Nov 1982

Walter Reed Army Medical Center  
Washington, DC 20307  
Student (Phase II)  
Radiology Department

Jun 1982 - Oct 1982

Academy of Health Sciences, US Army  
Fort Sam Houston, TX  
Student (Phase I)  
X-Ray Technology Branch

SPECIAL PRODUCTS LAB  
BLOOD BANK SECTION  
CLINICAL PATHOLOGY SERVICE  
DEPARTMENT OF PATHOLOGY AND AREA LABORATORY SERVICES  
WALTER REED ARMY MEDICAL CENTER  
WASHINGTON, D.C. 20307-5001

Effective \_\_\_\_\_  
Replaces Method of \_\_\_\_\_  
Reviewed V. Dow, M.D.  
25 Sept 89  
\_\_\_\_\_  
Revised \_\_\_\_\_  
Under Revision \_\_\_\_\_

CHAPTER II. TECHNICAL PROCEDURES

C.1. IRRADIATED BLOOD PRODUCTS - POLICIES AND PERSONNEL RESPONSIBILITIES

1. PURPOSE:

The only purpose of this instrument is the irradiating of blood products for transfusion to prevent post-transfusion graft vs host disease (GVHD) in immunocompromised patients. This form of GVHD, although fairly rare, is usually fatal due to generalized infection. This condition does not usually respond to forms of treatment normally effective in the GVHD which follows marrow transplantation. It is known that Ionizing radiation at doses of 2000 rads or more destroys the lymphocyte's ability to proliferate without damaging other elements of the blood product.

2. PATIENTS TO RECEIVE IRRADIATED BLOOD PRODUCTS:

Patients at risk for post-transfusion GVHD are those with some types of congenital or acquired cell-mediated immune deficiencies, such as:

- Bone Marrow transplant recipients (Autologous, Allogeneic & Syngeneic)
- Children and adults receiving cytotoxic therapy for:  
leukemias, lymphomas and some solid tumors (i.e. glioma & neuroblastoma)
- Patients with genetic immunodeficiencies:  
severe combined immunodeficiency (SCID), Wiscott-Aldrich syndrome, other T-cell defects
- Recipients of intrauterine transfusions
- Neonates receiving exchange transfusions and/or who have received intrauterine transfusions.

Patients will receive irradiated blood products only if the patient is so restricted; i.e. the Medical Director or his/her authorized representative must restrict the patient to irradiated blood products by noting on the patient's "CAUTION CARD" ... "Transfuse Irradiated Blood Products ONLY - (Date and Initial)". The "CAUTION CARD" must be conspicuously displayed as the top card of the patient's file. All orders from the ward for irradiated blood products must list the patient's diagnosis. Evaluation and approval will be at the discretion of the Blood Bank Medical Director.

3. BLOOD PRODUCTS TO BE IRRADIATED:

All blood products except fresh frozen plasma and cryoprecipitate theoretically contain sufficient immunocompetent lymphocytes to initiate the GVHD reaction. Therefore, the following blood products must be irradiated just prior to issue to the ward when prescribed for patients at risk for post-transfusion GVHD:

- Whole blood
- Red Blood Cells (including washed, leukocyte-poor, frozen/deglycerolized and washed/prefiltered aliquots)
- Platelets (including leukotrapped, random donor, single donor, and HLA-matched)
- Fresh single donor plasma
- Granulocyte concentrates

Irradiated blood products are not themselves radioactive and present no danger to the persons handling them or to the patients receiving them. Cellular elements other than lymphocytes are relatively unaffected by less than 5000 rads of gamma radiation. Therefore, irradiated products returned to the general inventory may be used for routine transfusions to other patients who do not require irradiated products.

4. DOSE:

The standard dose at WRAMC is 2500 rads which can be administered in approximately 1.6 minutes (96 seconds). All units, once irradiated, will be conspicuously labeled as per S.O.P.

5. PERSONNEL RESPONSIBILITIES:

- a. Authorized Principal User (APU): This is the person designated and approved by the WRAMC Radiation Control Committee for use of the [ ] The Blood Bank APU is the Special Products Laboratory Team Leader. This person is directly responsible for the control & safe use of the [ ] irradiator and will designate individuals to operate the [ ] as approved by the WRAMC Radiation Control Committee. The APU will have the following specific responsibilities:
1. Ensure that the [ ] is operated only by individuals authorized to do so by the WRAMC Radiation Control Committee, and in accordance with the conditions of the WRAMC Radiation Material authorization.
  2. Instruction of individuals in safe operating procedures in accordance with the S.O.P.'s in this Manual pertaining to Irradiated Blood Products.
  3. Ensuring that these instructions and references are available at all times.
  4. Promptly reporting any source malfunction, accident, or other unplanned occurrence that could result in an unsafe condition or exposure to personnel to the WRAMC Health Physics Officer at (301)427-5107.
  5. Assuring that all personnel operating the unit are monitored by appropriate personnel monitoring devices.
  6. Ensuring that personnel operating the irradiator have been instructed in the hazards and nature of injuries resulting from over-exposure to ionizing radiation.
  7. Maintain the operating log for the [ ] [ ]

- b. WRAMC Health Physics Department:
1. Conducting routine radiation protection surveys and inspections.
  2. Providing technical assistance as required.
  3. Providing calibration and routine maintenance services for radiation detection and measuring instruments.
- c. Individual Operators:
1. Operating the [ ] in accordance with the operation and safety procedures delineated in the Special Products Lab S.O.P.
  2. Recording all pertinent information in the operating log maintained by the APU.
  3. Being familiar with the content of these instructions, requirements of the WRAMC authorization, and other regulations as may be prescribed by the APU.
  4. Locking the [ ] irradiator upon completion of use.
  5. Ensuring that the key to the [ ] is properly returned/signed back in to prevent unauthorized use.
  6. Reporting all malfunctions, accidents, and any other unplanned occurrence that could result in an unsafe condition or exposure of personnel promptly to the APU.

6. REFERENCES:

- a. Areman, E: Georgetown University Hospital - DLM, BB. S.O.P. - Irradiation of Blood Products. 1987.
- b. Connock, G: Walter Reed Army Institute of Research S.O.P. - Operating and Safety Procedures for AECL Gammacell 40 Irradiator. 1989.

Prepared by: David B. Drothler MT(ASCP)SBB

SPECIAL PRODUCTS LAB  
BLOOD BANK SECTION  
CLINICAL PATHOLOGY SERVICE  
DEPARTMENT OF PATHOLOGY AND AREA LABORATORY SERVICES  
WALTER REED ARMY MEDICAL CENTER  
WASHINGTON, D.C. 20307-5001

Effective \_\_\_\_\_  
Replaces Method of \_\_\_\_\_  
Reviewed N. Dow M.D.  
3 Oct 89  
\_\_\_\_\_  
Revised \_\_\_\_\_  
Under Revision \_\_\_\_\_

CHAPTER II. TECHNICAL PROCEDURES.

C.2. IRRADIATED BLOOD PRODUCTS - USE OF THE [ ] BLOOD IRRADIATOR

1. PRINCIPLE:

Any immunosuppressed patient receiving blood products containing immunocompetent lymphocytes may theoretically develop Graft vs Host disease. The most effective method of eliminating viable lymphocytes from blood products is to use ionizing radiation. The optimal dose of radiation that will prevent GVHD and yet not damage the other cellular elements in blood products is about 2000 to 2500 rads. The [ ] is a self-contained unit consisting of a stationary Cesium-137 doubly encapsulated [ ] curie radiation source permanently secured within a biological shield. By placing the sample can in the sample drawer and lowering the drawer into the machine, the blood product is either exposed to or, by raising the drawer, removed from the radiation field.

2. PROTECTIVE FEATURES / CAUTIONS:

- a. The [ ] has been designed for safe and efficient operation. The control system contains interlocks that prevent start-up if the correct procedure is not followed. To trouble-shoot the machine, see the following appropriate S.O.P. Faults that occur during operation cause the sample to return to the SAFE position.
- b. Radiation Protection: The shield is designed to reduce the radiation to the outside surface, from a fully loaded [ ] to levels less than those specified by ANSI N433.1.
- c. Interlock System: The sample drawer is interlocked with two switches that, unless pushed at the same time, prevent the drawer from moving so that potential injury to hands is avoided. DO NOT try to override the interlock system. Any attempt to disable the interlock system will violate licensing requirements.
- d. AC Power Failure: In case of a power failure during operation, the [ ] will complete the irradiation cycle in progress. However, a new cycle will not start until the AC power has been restored.
- e. Anchor Brackets: For stability, the [ ] is secured to the floor by two anchor brackets. It weights approximately 3000 lbs. and comes with an attached dolly. To prevent movement of the machine and to be in accordance with

WRAMC Health Physics Department regulations, the dolly has been removed and it must be anchored to the floor at all times. DO NOT move the [ ] without proper authorization from the pertinent authority.

f. CAUTION: ONLY TRAINED BLOOD BANK STAFF will be permitted to operate the [ ] Other persons or departments needing samples or blood products irradiated will contact the Special Products Lab Team Leader to arrange for this service. Failure to comply may result in loss of licensure to use radioactive materials.

g. CAUTION: Materials which are basically unstable, explosive, or highly exothermic WILL NOT BE IRRADIATED IN THIS UNIT.

h. CAUTION: All operators will.....

- fill out and sign the operator's log when using the machine
- obtain a personnel monitoring device and the machine key when the log has been signed. Personnel monitoring devices will be worn when working around (i.e. working in the [ ] room [ ] and/or operating the [ ]
- return the machine key and personnel monitoring device, and sign the log when finished using the machine.

3. SPECIMEN REQUIREMENTS:

a. Blood products that must be irradiated are.....

- Whole blood
- Red Blood Cells (including washed, leukocyte-poor, frozen/deglycerolized and washed/filtered aliquots - i.e. neonate syringes)
- Platelets (including leukotrapped, random donor, single donor, and HLA-matched)
- Fresh single donor plasma (NOT FRESH FROZEN PLASMA)
- Granulocyte concentrates

b. DO NOT irradiate more than one unit/syringe/type of product at a time. Placing multiple units on the specimen turntable together can cause the mechanism to overload, jam-up or possibly rupture a unit of blood.

c. Blood Products to be irradiated should not be pre-irradiated hours prior to issue. Irradiate all blood products at the time of issue.

4. INSTRUMENTATION: [ ] Blood Irradiator.

5. PROCEDURE:

a. Obtain a personnel monitoring device and the machine operation key from the [ ] Team Leader or the authorized designee & "sign them out" on the operator's log. For an example of the log see the "Results Reporting / Unit Labeling" section of this S.O.P.

b. Insert the machine key into the power keyswitch. DO NOT turn the key-switch to the "ON" position at this time.

c. Insert the sample/blood bag into the stainless steel sample can provided. Ensure that no parts of the sample protrude over the edge of the sample can. Place the sample can into the cavity, carefully centering it on the turntable and making sure no part of the can / contents extends past the opening of the cavity tube.

d. Turn the power switch to the "ON" position. The indicator light will be illuminated at this point and the turntable will rotate. Observe that the sample can is rotating freely.

e. Press the red IRRADIATE buttons (one on the control panel and one on the left side of the irradiator) at the same time to begin the cycle.

f. Routinely, at WRAMC, blood products will receive a dose of 2500 rads which can be delivered in 1.6 minutes (96 seconds) with this irradiator (See section 6 "Calculations" for clarification). The timer should remain set at 1.6 minutes. At the end of each cycle the timer will automatically reset - DO NOT CHANGE SETTING!

g. When the sample drawer has reached the irradiate position, the irradiate light on the control panel will be illuminated. If this light is not illuminated, the preset timer will not function.

NOTE: If this occurs, time the irradiation cycle with an independent timer for approximately 96 seconds. Then push the LOAD button to return the sample drawer to the load position. The LOAD switch will override the preset irradiator timer and return the sample drawer to the load position. This switch is to be used to end a preset irradiation cycle prior to the time preset, or to release a sample if the machine's timer malfunctions.

h. At the end of the irradiation cycle (when the timer count reaches 1.6 minutes), the sample drawer will return to the load position and the timer will automatically reset to 1.6 minutes (DO NOT CHANGE SETTING!).

NOTE: In case of a power failure, the irradiation cycle in progress will be completed. However, AC power will have to be restored to start a new cycle.

i. Remove the sample can from the sample cavity and remove the irradiated blood. Label the blood product, data control card and patient record card as indicated in the "Result Reporting/Unit Labeling" section below.

j. Turn the POWER keyswitch to the OFF position. Remove the key and return it to the key-box. Return your personnel monitoring device and sign them back "in" on the operators log. Issue the irradiated blood product as soon as possible.

6. CALCULATIONS:

The time interval necessary to provide a dose of approximately 2500 rads is a function of the CENTRAL DOSE RATE. For each machine, the actual radioactive contents may vary +/- 20% from the nominal values associated with each model, hence the CDR will vary accordingly & will need to be recalculated when installed & on a periodic basis. The CDR is provided by J. L. Shepherd on a Measurement Certificate. The measurement is in air and requires conversion to liquids, which is assumed to be evenly distributed in the beaker, giving an Average Dose Rate. The CDR is measured in rads/hr, the ADR must be rads/min. The following calculation is used:

$$\text{ADR (rads/min)} = 0.89 \times (\text{CDR (rads/hr)} \times 60) \quad (\text{For this machine, assume } \boxed{\phantom{0.89}} \boxed{\phantom{60}})$$

$$\text{Time interval for required dose} = \text{required DOSE} / \text{ADR}$$

Ex 2

7. RESULTS REPORTING/UNIT LABELING:

When the irradiator is used to irradiate blood products, there are 4 logs/cards etc. that must be filled out: operator's log, the unit label, the unit data control card (IBM card), and the patient's transfusion record card.

a. **Operator's Log:** This log will be kept in the [ ] and is to be filled out by the operator each time the machine is used. The entries are:

- Date Used, in designated format listed at top of log
- Operator Name, print full name
- Time - Key Out, time the key is signed out
- Dosimeter Reading, record the reading from the dosimeter both signing out and signing in
- # of Prod. Irrad., record how many products you irradiated
- Time - Key Returned, time the key is signed back in
- Tech. Initials, initials of the operator
- APU, initials of the authorized principal user. On day shift, the SPL Team Leader, on other shifts, the shift leader
- Workl'd, this is for workload, to be left blank until results are captured.

b. **Unit Label:** When a blood product is irradiated, it must be conspicuously labeled. Apply one of the following supplied labels to the face label of the blood product being careful to not cover any other information required by standards.

c. **Unit Data Control Card:** When the blood product is irradiated, it must be documented on the "IBM" card. Place one of the "IRRADIATED" labels on the "IBM" card on the next line under the patient's name and write the date and your initials next to the label.

d. **Patient Transfusion Record Card:** When the blood product is irradiated, it must be documented on the patient's transfusion record card ("white" card). Write "IRRAD." in the margin beside the particular blood product irradiated.

For examples of each, see Figures 1 and 2, below and on the next page.

UNIT NO. <u>3690000</u>		EXP. DATE <u>31 Feb 99</u>	DATE RECEIVED <u>32 Jan 99</u>
EXPIRES	SOURCE	TYPE UNIT	RECIPIENT NAME (Last, First, MI), SSAN
 Nonreactive by serologic test for HTLV-III, Nonreactive for HBsAg and syphilis by FDA required tests. No unexpected antibodies detected. <b>Rh NEGATIVE</b>	WRGH	<input checked="" type="checkbox"/> Whole Blood	30 Feb - <u>Questor, Christopher</u> IRRADIATED - <u>30 Feb 99, HQ</u>
	MWBB	<input checked="" type="checkbox"/> Packed RBC	
	Fr Knox	Platelet Pack	
	McQuire	Fresh Frozen	
	Fr Dix	CRYO	
	Other*	Fibrinogen	
SHIPPED TO	Rhe GAM		
MWBB	Lease Pool		
Fr Moode	Other*		
Fr Belvoir			
WRAIR			
Other*			

BRANC FORM 1631  
1 FEB 77

**BLOOD BANK CONTROL DATA**

Figure 1 - EXAMPLE OF UNIT DATA CONTROL CARD WITH THE APPROPRIATE CHANGES/LABELS.

BLOOD IRRADIATOR OPERATOR'S LOG									
DATE USED (DD/MM/YR)	OPERATOR NAME - PRINT	TIME - KEY OUT (HOUR)	DOSIMETER READING		# OF PROD. KEY BACK IRRA.	TIME - KEY BACK (HOUR)	TECH. INIT.	A.P.U.	WORK'D
			out	in					
30/2/99	Questor, Peter	1430	001	001	2	1434	PQ	1880	

PATIENT'S NAME: Questor, Christopher				ID NO.: 02-184846285				GROUP & RH: O Neg							
REMARKS:															
SHIFT	DAY	MONTH	YEAR	UNIT NO.	GROUP & RH	COMPO- NENT	EXP. DATE	SPECIMEN IDENT.	COMPATIBILITY			TECH	RELEASE	TRANS.	
									IS	ALL	LOC				
IrRad.	1	30	2	99	3A0000	Uny	PRBC	31 Feb	30 Feb 99	O	A	WT	C	1880	

Figure 2 - EXAMPLES OF OPERATOR'S LOG AND PATIENT TRANSFUSION RECORD CARD WITH THE APPROPRIATE CHANGES/UPDATES.

8. LIMITATIONS OF PROCEDURE:

This S.O.P. is intended to address how to use the Blood Irradiator to irradiate blood products for transfusion. Specifically, it addresses: what products, when to irradiate, who may use the irradiator, how to operate it, limited problem solving and documentation or labeling necessary. Consult the appropriate S.O.P., the machine Operator's Manual or the Special Products Lab Team Leader for procedures that fall outside the scope of this S.O.P.

9. REFERENCES:

- a. Operator's Manual.
- b. Areman, E: Georgetown University Hospital - DLM, BB. S.O.P. - Procedure: Irradiation of Blood Products. 1987.
- c. Connock, G: Walter Reed Army Institute of Research S.O.P. - Operating and Safety Procedures for AECL Gammacell 40 Irradiator. 1989.

Prepared by: David B. Drothler MT(AS-P)SBB

Ex 2

SPECIAL PRODUCTS LAB  
BLOOD BANK SECTION  
CLINICAL PATHOLOGY SERVICE  
DEPARTMENT OF PATHOLOGY AND AREA LABORATORY SERVICES  
WALTER REED ARMY MEDICAL CENTER  
WASHINGTON, D.C. 20307-5001

Effective \_\_\_\_\_  
Replaces Method of \_\_\_\_\_  
Reviewed W. D. M. D.  
30 Oct 89  
Revised \_\_\_\_\_  
Under Revision \_\_\_\_\_

CHAPTER II. TECHNICAL PROCEDURES.

C.3. IRRADIATED BLOOD PRODUCTS - TROUBLE-SHOOTING THE IRRADIATOR

BLOOD

1. PRINCIPLE:

The [ ] is a self-contained unit consisting of a stationary Cesium-137 doubly encapsulated curie radiation source permanently secured within a biological shield. By placing the sample can in the sample drawer and lowering the drawer into the machine, the blood product is either exposed to or, by raising the drawer, removed from the radiation field.

Because of the importance of the machine's application in the Blood Bank, it is essential that the "down time" is minimal. Occasionally, parts of the equipment may break down. Should this occur, simple trouble-shooting with corrective action would be immediately necessary. The following S.O.P. lists potential problems with corrective action necessary.

2. CAUTIONS:

- a. DO NOT attempt any corrective action requiring new parts beyond a fuse.
- b. DO NOT undertake any repair beyond changing a fuse, perform any maintenance, remove any interlock and/or safety device, or make any changes in and/or on the [ ] without prior approval of the Authorized Principal User or higher authority. Failure to comply may result in loss of licensure to use radioactive materials.

3. PROCEDURE:

a. If the [ ] or any of its components malfunction, follow the Trouble-shooting Charts in Figures 2 and 3. These charts will help identify the problem and suggest corrective action and Figure 1 is a diagram of the locations of the parts.

b. If the corrective action suggested is to change the fuse, record the problem, corrective action taken, date and initials on the Equipment Maintenance Worksheet (Med Lab Form 110) kept in the front of the [ ] Operator's Manual.

c. To change the fuse: refer to the operator's manual for location of and procedure for changing the fuse. (NOTE: this procedure with diagram for Figure 1 is to be supplied by the manufacturer upon delivery of the machine and placed in this S.O.P.)

d. Should the problem remain unsolved, or be more complex than any of the possibilities listed, contact the APU for further action and DO NOT attempt to use the irradiator. Refer to the S.O.P. - "Emergency Procedures..." for steps to follow in the event of complete or non-correctable equipment failure. Further, before proceeding, ensure that the correct operating procedure has been followed and the unit is plugged in.

4. LIMITATIONS OF PROCEDURE:

This S.O.P. is intended to address how to perform simple troubleshooting on the Blood Irradiator. If the problem is too complicated or requires new parts to repair at this time, consult the machine Operator's Manual and the Special Products Lab Team Leader for additional instructions.

5. REFERENCES:

a.

Operator's Manual.

b. Connock, G: Walter Reed Army Institute of Research S.O.P. - Operating and Safety Procedures for AECL Gammacell 40 Irradiator. 1989.

Prepared by: David B. Drothler MT(ASCP)SBB

NOTE: THIS DIAGRAM IS UNDER PRODUCTION AND IS TO BE PROVIDED BY THE MANUFACTURER  
UPON DELIVERY OF THE IRRADIATOR.

Figure 1 - COMPONENT LOCATION FOR TROUBLE-SHOOTING THE

PAGE: \_\_\_\_\_

(II.C.3.page 3 of 5)

Ex 2

NOTE: THIS CHART IS UNDER PRODUCTION AND IS TO BE PROVIDED BY THE MANUFACTURER  
UPON DELIVERY OF THE IRRADIATOR.

Figure 2 - TROUBLE-SHOOTING CHART FOR THE

NOTE: THIS CHART IS UNDER PRODUCTION AND IS TO BE PROVIDED BY THE MANUFACTURER  
UPON DELIVERY OF THE IRRADIATOR.

Figure 3 - TROUBLE-SHOOTING CHART FOR THE

- CONT'D

PAGE: \_\_\_\_\_

(II.C.3.page 5 of 5)

EX 2

SPECIAL PRODUCTS LAB  
BLOOD BANK SECTION  
CLINICAL PATHOLOGY SERVICE  
DEPARTMENT OF PATHOLOGY AND AREA LABORATORY SERVICES  
WALTER REED ARMY MEDICAL CENTER  
WASHINGTON, D.C. 20307-5001

Effective \_\_\_\_\_  
Replaces Method of \_\_\_\_\_  
Reviewed N. Daw M.D.  
3 Oct 89  
\_\_\_\_\_  
Revised \_\_\_\_\_  
Under Revision \_\_\_\_\_

CHAPTER II TECHNICAL PROCEDURES.

C.4. IRRADIATED BLOOD PRODUCTS - EMERGENCY PROCEDURES FOR THE IRRADIATOR FAILURE

1. POWER FAILURE:

a. In case of an AC power failure, the irradiation cycle in progress at the time will be completed and the sample drawer will return to the safe "LOAD" position powered by the DC power back-up.

b. However, the AC power will have to be restored to start a new irradiation cycle. When the hospital Emergency Power starts, normal operation may resume.

2. EQUIPMENT FAILURE:

Should there be any mechanical difficulties with this instrument, see the preceding S.O.P. on trouble-shooting the machine. If the troubleshooting procedure does not correct the problem, or the problem is too complicated to correct at this time, arrange to have the products irradiated by another means\* and contact the following:

- a. Authorized Principal User [ ] Team Leader, Blood Bank, WRAMC, 6-1989/1990/1993.
- b. Health Physics Officer - WRAMC, (301)427-5107.
- c. Safety Officer - WRAMC, 6-1042/1044.

After duty hours, contact in order:

- a. Authorized Principal User [ ] Team Leader, Blood Bank, WRAMC, at home. If unable to contact, call the Technical Support Staff member on call.
- b. Staff Duty NCO - WRAMC (after duty hours), 6-1233.

[ ] If serious, the senior individual at the site shall clear the area (i.e. the room) of personnel and restrict access to the area until relieved by competent authority.

(\*Alternative sources for irradiating blood products: see the following page)

PAGE: \_\_\_\_\_

(II.C.4. page 1 of 2)

EX 2

\*Alternative sources for irradiating blood products:

- |    |   |          |
|----|---|----------|
| 1. | N.I.H. Dept. of Transfusion Medicine      | 496-4506 |
| 2. | Children's Hospital Blood Bank            | 745-5347 |
| 3. | Georgetown University Hospital Blood Bank | 784-3511 |

3. UNSAFE READING ON RADIATION MONITOR:

The senior individual at the site must clear the area (i.e. the [ ] room [ ] of all personnel and restrict access to the area. Immediately contact the personnel listed in #2 above.

4. IN THE EVENT OF FIRE:

The following individuals shall be notified:

**ALWAYS FIRST:**

- a. Fire Department, WRAMC, 6-3317.

**THEN:**

- b. Authorized Principal User - [ ] Team Leader, Blood Bank, WRAMC, 6-1989/1990/1993.
- c. Health Physics Officer - WRAMC, (301)427-5107.
- d. Safety Officer - WRAMC, 6-1042/1044.

After duty hours, contact the fire department **FIRST**, then contact in order:

- a. Authorized Principal User - [ ] Team Leader, Blood Bank, WRAMC, at home. If unable to contact, call the Technical Support Staff member on call.
- b. Staff Duty NCO - WRAMC (after duty hours), 6-1233.

The senior individual at the site shall clear the area (i.e. [ ] room [ ] of personnel and restrict access to the area until relieved by competent authority. Fire fighters may enter the area after the radiation hazard has been determined. There is little likelihood of radiation hazard unless the temperature of the source shield reaches the melting point of lead (621 F). Water should be sprayed on the source shield if there is any possibility of the temperature approaching this value.

Following an emergency, the [ ] shall not be operated until an inspection and a radiation protection survey have been conducted by WRAMC Health Physics.

5. REFERENCES:

- a. [ ] Operator's Manual.
- b. Areman, E: Georgetown University Hospital - DLM, BB. S.O.P. - Emergency Procedures, Gammacell-1000 Blood Irradiator. 1987.
- c. Connock, G: Walter Reed Army Institute of Research S.O.P. - Operating and Safety Procedures for AECL Gammacell 40 Irradiator. 1989.

Prepared by: David B. Drothler MT(ASCP)SBB.

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Effective \_\_\_\_\_  
Replaces Method of \_\_\_\_\_  
Reviewed N. Dou, M.D.  
30 Oct 89  
\_\_\_\_\_  
Revised \_\_\_\_\_  
Under Revision \_\_\_\_\_

CHAPTER IV. QUALITY CONTROL / PREVENTIVE MAINTENANCE.

D.2. PREVENTIVE MAINTENANCE - FOR THE

BLOOD IRRADIATOR

1. PRINCIPLE:

The [ ] is a self-contained unit consisting of a stationary Cesium-137 doubly encapsulated [ ] curie radiation source permanently secured within a biological shield. By placing the sample can in the sample drawer and lowering the drawer into the machine, the blood product is either exposed to or, by raising the drawer, removed from the radiation field.

Because of the importance of the machine's application in the Blood Bank, it is essential that the "down time" is minimal. Periodically, parts of the [ ] will require maintenance to prevent this "down time". The following S.O.P. lists the specific maintenance recommended to keep the machine functioning properly.

2. CAUTIONS:

a. DO NOT undertake or perform any maintenance, remove any interlock and/or safety device, or make any changes in and/or on the [ ] without prior approval of the Authorized Principal User and the WRAMC Health Physics Officer. Failure to comply may result in loss of licensure to use radioactive materials.

b. Spills of materials inside the sample cavity could result in seizing of the turntable with subsequent loss of the uniformity of exposure to samples. NEVER place a unit of blood into the machine without placing the unit in the sample can first!

c. Disconnect the AC and DC power prior to any maintenance work.

3. GENERAL:

The [ ] will require minimum maintenance when operated in normal room conditions. The irradiator should be kept in clean condition, and any spills of liquids or powders inside the sample cavity should be thoroughly cleaned immediately.

4. PERIODIC INSPECTION AND ADJUSTMENT:

a. The roller chain may require adjustment in the drive system. Electrical connections will require inspection and electrical switches may require adjustment or replacement.

b. This is to be performed on a yearly basis by a **FACTORY REPRESENTATIVE ONLY**. Prior to having this done, notify the Health Physics department to have a representative present when the machine cover panel is removed.

c. The **FACTORY REPRESENTATIVE WILL:**

- Unplug the [ ] from the wall outlet. Remove the control and cover panels as per manufacturer's directions and as indicated in the drawing in Figure 1, next page.
- Inspect all electrical connections for looseness.
- Replace the panels and reconnect the control wires.

d. Due to the decay of Cesium, to ensure a consistent administration of a dose between 2000 and 2500 rads, the exposure time setting must be re-calculated and, if necessary, the timer reset. This is to be performed on a yearly basis at the same time as the periodic inspection and adjustment. The Authorized Principle User will be responsible for the re-calculation and possible resetting of the timer. The re-calculation will be based on the Cesium-137 decay curve in the operator's manual. If the result of the calculation differs from the current exposure setting by 0.1 minutes, reset the timer per manufacturer's instructions in the operator's manual and indicate the change in the S.O.P. - Chapter II, C.2. Use the following calculation:

(Fraction of Activity Remaining: from decay curve) x (Original CDR) =  
Central Dose Rate (rads/hr.) now being delivered

$$\text{ADR (rads/min)} = 0.89 \times (\text{CDR "now"} \times 60) \quad \text{New Time Interval} = \frac{\text{required DOSE}}{\text{ADR}}$$

5. AC FUSE REPLACEMENT:

If it is necessary to replace an AC fuse, see the preceding S.O.P. - Chapter II, C.3. TROUBLE-SHOOTING THE [ ] BLOOD IRRADIATOR.

6. LIMITATIONS OF PROCEDURE:

This S.O.P. is intended to address how to perform preventive maintenance on the [ ]

7. REFERENCES:

- a. [ ] Operator's Manual.
- b. Areman E: Georgetown University Hospital - DLM, BB. S.O.P. - Procedure: Irradiation of Blood Products. 1987.

Prepared by: David B. Drothler MT(ASCP)SBB

NOTE: THIS DIAGRAM IS UNDER PRODUCTION AND IS TO BE PROVIDED BY THE MANUFACTURER  
UPON DELIVERY OF THE [ ] IRRADIATOR.

Figure 1 - COMPONENT LOCATION FOR MAINTENANCE OF THE [ ]

IRRADIATOR

PAGE: \_\_\_\_\_

(IV.D.2.page 3 of 3)

Ex 2

**AWARD / CONTRACT**

1. THIS CONTRACT IS A RATED ORDER  
R DPAS (15 CFR 350)

RATING: **C98**

PAGE OF PAGES  
**1 04**

2. CONTRACT (Proc. Inst. Ident.) NO.  
**DADA15-89-C-0066**

3. EFFECTIVE DATE  
**09/08/89**

4. REQUISITION/PURCHASE REQUEST/PROJECT NO.  
**W74MYG-9116-2506**

5. ISSUED BY  
CODE **DADA15**  
**DIRECTORATE OF CONTRACTING  
WALTER REED ARMY MEDICAL CTR  
WASHINGTON, D.C. 20307-5000**

6. ADMINISTERED BY (If other than item 5) CODE **A01**  
**Admin Inquiries See Block 6  
Pay/Invoice Info See Block 15**

7. NAME AND ADDRESS OF CONTRACTOR (No., street, city, county, State and ZIP Code)  
**JL SHEPHERD & ASSOCIATES  
1010 ARROYO AVENUE  
SAN FERNANDO, CA 91340-1822**

8. DELIVERY  
 FOB ORIGIN  OTHER (See below)  
9. DISCOUNT FOR PROMPT PAYMENT  
**00.000%00 Net 030**  
10. SUBMIT INVOICES (4 copies unless otherwise specified) TO THE ADDRESS SHOWN IN:  
ITEM **12**

11. SHIP TO/MARK FOR  
CODE **00005377** FACILITY CODE  
CODE **W74myg**  
**PROPERTY MANAGEMENT BRANCH  
WHSE 178 - FOREST GLEN SECTION  
2461 LINDEN LANE - WRAMC  
SILVER SPRING, MD 20910**

12. PAYMENT WILL BE MADE BY CODE **YMEAMK**  
**F&AO, Commercial Accts. Section  
Bldg 11, Rm 1-101  
WRAMC, Telephone: (202)576-3123  
Washington, DC 20307-5000**

13. AUTHORITY FOR USING OTHER THAN FULL AND OPEN COMPETITION:  
 10 U.S.C. 2304(c)( )  41 U.S.C. 253 (c)( )

14. ACCOUNTING AND APPROPRIATION DATA  
**2192035 906-2040 p5310-31nj s18126 aaur proj-med p893219**

13A. ITEM NO.	13B. SUPPLIES/SERVICES	13C. QUANTITY	13D. UNIT	13E. UNIT PRICE	13F. AMOUNT
See attached Schedule(s)					

15G. TOTAL AMOUNT OF CONTRACT **\$ 54,785.00**

**16. TABLE OF CONTENTS**

(X)	SEC	DESCRIPTION	PAGE (S)	(X)	SEC	DESCRIPTION	PAGE (S)
PART I - THE SCHEDULE				PART II - CONTRACT CLAUSES			
X	A	SOLICITATION/CONTRACT FORM	1	X	I	CONTRACT CLAUSES	4
X	B	SUPPLIES OR SERVICES AND PRICES/COSTS	2	PART III - LIST OF DOCUMENTS, EXHIBITS AND OTHER ATTACHMENTS			
X	C	DESCRIPTION/SPECS./WORK STATEMENT	2	J		List of Attachments	
X	D	PACKAGING AND MARKING	1	PART IV - REPRESENTATIONS AND INSTRUCTIONS			
X	E	INSPECTION AND ACCEPTANCE	1	K		REPRESENTATIONS, CERTIFICATIONS AND OTHER STATEMENTS OF OFFERORS	
X	F	DELIVERIES OR PERFORMANCE	2	L		INSTRS., CONDS., AND NOTICES TO OFFERORS	
X	G	CONTRACT ADMINISTRATION DATA	6	M		EVALUATION FACTORS FOR AWARD	
	H	SPECIAL CONTRACT REQUIREMENTS					

**CONTRACTING OFFICER WILL COMPLETE ITEM 17 OR 18 AS APPLICABLE**

17.  CONTRACTOR'S NEGOTIATED AGREEMENT (Contractor is required to sign this document and return \_\_\_\_\_ copies to issuing office.) Contractor agrees to furnish and deliver all items or perform all the services set forth or otherwise identified above and on any continuation sheets for the consideration stated herein. The rights and obligations of the parties to the contract shall be subject to and governed by the following documents: (a) this award/contract, (b) the solicitation, if a y, and (c) such provisions, representations, certifications, and specifications, as are attached or incorporated by reference herein. (Attachments are listed herein.)

18.  AWARD (Contractor is not required to sign this document.) Your offer on Solicitation Number **DADA15-89-R-0122** including the additions or changes made by you which additions or changes are set forth in full above, is hereby accepted as to the items listed above and on any continuation sheets. This award consummates the contract which consists of the following documents: (a) the Government's solicitation and your offer, and (b) this award/contract. No further contractual document is necessary.

19A. NAME AND TITLE OF SIGNER (Type or print)  
**BY \_\_\_\_\_**  
(Signature of person authorized to sign)

20A. NAME OF CONTRACTING OFFICER  
**DAVID D. DENTON (202)576-8221**  
20B. UNITED STATES OF AMERICA  
**BY *[Signature]***  
Signature of Contracting Officer  
20C. DATE SIGNED  
**12 SEP 1989**

SF 26 Continued.....

The following revisions are hereby mutually accepted and are hereby incorporated into subject contract:

1. Amendment #0001 dated 7/21/89, attached at rear of contract document.
2. Contractor's Best and Final Offer is made part of the award.
3. Sections K,L and M of Solicitation DADA15-89=R-0122 are made part of the award and are incorporated by reference.

# JL SHEPHERD & ASSOCIATES

**FAXED**  
9/5/89

1010 ARROYO AVE., SAN FERNANDO, CALIFORNIA 91340-1822

818-898-2361 FAX 818-361-8095

September 5, 1989

Mr. David D. Denton  
Contracting Division  
Directorate of Contracting -  
Supply & Equipment Branch

Re: Your Fax of September 1, 1989 Requesting Clarification of  
Proposal on Solicitation DADA15-89-R-0122

Dear Mr. Denton:

will provide to Walter Reed Army  
Medical Center a [ ] with [ ] Curies. We are cur-  
rently in production on this model and can easily accommodate the  
60 day delivery schedule.

As another added benefit, the 3,000 Rad dose will be delivered in  
2-3 minutes, not 6. These are the only changes to Proposal 1,  
Revision A.

The pricing of \$53,285 shall be firm for this device.

Please do not hesitate to contact us if any further questions  
arise. We look forward to your favored reply.

Sincerely,

J.L. SHEPHERD & ASSOCIATES

  
Joseph S. Shepherd  
Director, Business Development

JSS/mp

Ex 2

J.L. SHEPHERD & ASSOCIATES BEST AND FINAL OFFER

Proposal 1  
Revision A

Solicitation No. DADA15-89-R-0122

CESIUM-137 BLOOD PRODUCT IRRADIATOR

SAMPLE CHAMBER: 4" Dia. x 8" High - 1.64 Liters

Performance Specifications

1. Cesium-137 in "Special Form" encapsulation to be provided for gamma radiation to inactivate lymphocytes in blood and blood components.
2. The device shall be self-shielding encasing the Cesium-137 source in a double walled stainless steel holder.
3. The stainless steel holder shall be permanently installed and sealed in a lead encased biological shield.
4. The system shall contain [ ] Curies Cesium-137 in 4 distinct sources. The dose rate variation shall be  $\pm 15\%$  over the sample chamber.
5. The external radiation levels shall be less than 2.0 mR/hr at the SURFACE of the device in all operating modes. This is below the requirements of ICRP #15.
6. A [ ] dose shall be delivered in [ ] minutes.
7. The sample chamber shall incorporate a built in turntable which rotates at approximately 7 rpm. The sample shall be automatically rotated towards and away from the Cesium-137 source.
8. A battery back-up system shall be provided to allow cycle completion in case of power failure. A manual return system shall also be provided.
9. A keyswitch shall control electrical power.
10. A sample chamber door shall be provided. The turntable shall not operate unless the door is closed.
11. An audible alarm shall sound upon completion of the irradiation cycle. The alarm shall NOT cease until the door is opened.

12. The device shall operate safely in accordance with the requirements of ICRP #15.
13. The device shall weigh approximately 3,000 lbs. Dimensions shall be 31" x 31" x 66" (78" with sample chamber in "LOAD" position).
14. An eight hour training session for at least six people shall be included.

Additional Features

15. An electronic timer (0000.00 min.) with automatic reset shall be provided.
16. The device shall be mounted on a rolling dolly with locking mechanism.
17. A baked enamel steel cover shall be standard.
18. A stainless steel sealable sample canister shall be provided.
19. The device shall be designed and certified to meet all US DOT 7A container specifications.

Safety

20. Dual "IRRADIATE" switches which are required to operate the sample drawer negate the possibility of operator being hurt during drawer travel.

Warranty

21. The warranty shall be as follows:
  - a. 12 months on parts and labor.
  - b. Additional 48 months on parts.

22. PRICE (F.O.B. Destination) - \$53,285

Delivery

23. 60 Days ARO

SF 26 Continued.....

The following revisions are hereby mutually accepted and are hereby incorporated into subject contract;

1. Amendment #0001 dated 7/21/89, attached at rear of contract document.
2. Contractor's Best and Final Offer is made part of the award.
3. Sections K,L and M of Solicitation DADA15-89=R-0122 are made part of the award and are incorporated by reference.

**SOLICITATION, OFFER AND AWARD**

THIS CONTRACT IS A RATED ORDER.

NG

4. PAGE OF PAGES

UNDER DPAS (15 CFR 350)

00

1

1. CONTRACT NO.	2. SOLICITATION NO. DADA15-89-R-0122	4. TYPE OF SOLICITATION <input type="checkbox"/> SEALED BID (IFB) <input checked="" type="checkbox"/> NEGOTIATED (RFP)	5. DATE ISSUED 07/17/89	6. REQUISITION/PURCHASE NO. W74MYG-9116-2506
7. ISSUED BY DIRECTORATE OF CONTRACTING WALTER REED ARMY MEDICAL CTR WASHINGTON, D.C. 20307-5000		8. ADDRESS OFFER TO (If other than item 7) Directorate of Contracting Bldg T-20, 1st Floor Walter Reed Army Medical Cntr Washington, DC 20307-5000		

NOTE: In sealed bid solicitations "offer" and "offeror" mean "bid" and "bidder".

**SOLICITATION**

9. Sealed offers in original and 1 copies for furnishing the supplies or services in the Schedule will be received at the place specified in item 8, or if handcarried, in the depository located in DIRECTORATE OF CONTRACTING until 04:30 local time 08/17/89 (Hour) (Date)

CAUTION - LATE Submissions, Modifications, and Withdrawals: See Section L, Provision No. 52.214-7 or 52.215-10. All offers are subject to all terms and conditions contained in this solicitation.

10. FOR INFORMATION CALL:	A. NAME DELORES WRIGHT	B. TELEPHONE NO. (include area code) (NO COLLECT CALLS) (202)576-8228
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**11. TABLE OF CONTENTS**

(X)   SEC I	DESCRIPTION	PAGE (S)	(X)   SEC I	DESCRIPTION	PAGE(S)
PART I - THE SCHEDULE			PART II - CONTRACT CLAUSES		
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X   B	SUPPLIES OR SERVICES AND PRICES/COSTS	2	PART III - LIST OF DOCUMENTS, EXHIBITS AND OTHER ATTACH.		
X   C	DESCRIPTION/SPECS./WORK STATEMENT	2	J	LIST OF ATTACHMENTS	
X   D	PACKAGING AND MARKING	1	PART IV - REPRESENTATIONS AND INSTRUCTIONS		
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X   F	DELIVERIES OR PERFORMANCE	2	X   L	INSTRS., CONDS., AND NOTICES TO OFFERORS	10
X   G	CONTRACT ADMINISTRATION DATA	6	X   M	EVALUATION FACTORS FOR AWARD	1
X   H	SPECIAL CONTRACT REQUIREMENTS				

**OFFER (Must be fully completed by offeror)**

NOTE: Item 12 does not apply if the solicitation includes the provisions at 52.214-16, Minimum Bid Acceptance Period.

12. In compliance with the above, the undersigned agrees, if this offer is accepted within \_\_\_\_\_ calendar days (80 calendar days unless a different period is inserted by the offeror) from the date of receipt of offers specified above, to furnish any or all items upon which prices are offered at the price set opposite each item, delivered at the designated point(s), within the time specified in the schedule.

13. DISCOUNT FOR PROMPT PAYMENT (See Section 1, Clause No. 52-232-8)		10 CALENDAR DAYS	%	20 CALENDAR DAYS	%	30 CALENDAR DAYS	%	CALENDAR DAYS	%
NET									
14. ACKNOWLEDGMENT OF AMENDMENTS (The offeror acknowledges receipt of amendments to this SOLICITATION for offerors and related documents numbered and dated:									
AMENDMENT NO.		DATE		AMENDMENT NO.		DATE			

15A. NAME AND ADDRESS OF OFFEROR J L Shepherd & Associates 1010 Arroyo Avenue San Fernando, CA 91340	CAGE CODE <u>29345</u>	FACILITY	16. NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER (Type or print) Joseph S. Shepherd Director, Business Development
15B. TELEPHONE NO. (include area code) (818) 898-2361	15C. CHECK IF REMITTANCE ADDRESS IS DIFFERENT FROM ABOVE - ENTER SUCH ADDRESS IN SCHEDULE. <input type="checkbox"/>	17. SIGNATURE 	18. OFFER DATE August 15,

**AWARD (To be completed by Government)**

19. ACCEPTED AS TO ITEMS NUMBERED	20. AMOUNT	21. ACCOUNTING AND APPROPRIATION
22. AUTHORITY FOR USING OTHER THAN FULL AND OPEN COMPETITION: <input type="checkbox"/> 10 U.S.C. 2304 (c) ( ) <input type="checkbox"/> 41 U.S.C. 253(c) ( )		23. SUBMIT INVOICES TO ADDRESS SHOWN IN (4 copies unless otherwise specified)  ITEM
24. ADMINISTERED BY (If other than item 7) CODE	25. PAYMENT WILL BE MADE BY CODE	
26. NAME OF CONTRACTING OFFICER (Type or print)	27. UNITED STATES OF AMERICA (Signature of Contracting Officer)	28. AWARD DATE

IMPORTANT - This award will be made on this Form, or on Standard Form 28, or by other authorized official written notice.

NSN 7540-01-3064 PREVIOUS EDITION NOT USABLE

33-132

STANDARD FORM 33 (REV. 4-85) Prescribed by GSA FAR (48 CFR) 53.214(c)

SECTION B  
SUPPLIES OR SERVICES AND PRICES/COSTS

B.1. SCOPE

B.1.1. This solicitation is for the acquisition and delivery of a Gammacell 1000 Elite Blood Product Irradiator, brand name or equal by Nordion International, Inc., for use by the department of Pathology and ALS Blood Bank, Walter Reed Army Medical Center, Washington, D.C.

B.2. COMMERCIAL WARRANTY

B.2.1. The contractor agrees that the supplies/equipment furnished under this contract shall be covered by the most favorable commercial warranties the contractor gives to any customer for such supplies/equipment and that the rights and remedies provided herein are in addition to and do not limit any rights afforded to the Government by any other clause of this contract. Offeror shall complete the following:

Warranty Period: \_\_\_\_\_

Starting Date of Warranty: \_\_\_\_\_

Warranty certificate shall be furnished with the items at time of inspection and acceptance.

B.3. BRAND NAME OR EQUAL

B.3.1. Offerors are cautioned as to the need to comply with the applicable terms of the Brand Name or Equal Clause, paragraph L-9.

Contractors offering products which differ from the reference brand name shall be considered for award when the Contracting Officer determines that the offered product is equal in all material aspects to the product referenced. Offers will not be rejected because of minor differences in design, construction, or features which do not affect the suitability of the product for its intended use. The product offered must meet the essential characteristics listed in Section C of this solicitation.

Offerors are also cautioned that the submittal of any statement (such as offerors descriptive literature) to the effect that specifications are subject to change without notice may render the offer non-responsive and cause its rejection.

B.4. BRAND NAME OR EQUAL PROPOSALS

The Contract Line Items (CLIN) requested in The Schedule are identified as Brand Name or Equal. The catalog or model numbers referenced for each CLIN are manufactured by the company identified below. Please provide the brand

ITEM                      DESCRIPTION                      QUANTITY    U/M                      U/P                      AMOUNT  
name, manufacturers name and catalog/model numbers for the items you are offering in your proposal in the space below the line:

Reference Items are manufactured by:    Gammacell By Nordion

B.5. THE SCHEDULE

<u>ITEM</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>	<u>U/M</u>	<u>U/P</u>	<u>AMOUNT</u>
0001	6640-01-C14-1974 GAMMACELL 1000 ELITE BLOOD PRODUCT	1	EA	53285.000000	53285.00
0001	(Continued)				
	IRRADIATOR 115 VAC, 60 Hz, MODEL D OFFERING ON - BRAND NAME: _____ MANUFACTURER: _____ CATALOG/MODEL NUMBERS: _____				
0002	2 COPIES OF EACH TECHNICAL LITERATURE TO INCLUDE OPERATOR MANUAL, WIRING DIAGRAMS, PARTS LISTING WITH PRICES, AND PREVENTIVE MAINTENANCE RECOMMENDATION, IN ADDITION TO ONE (1) FREE COPY OF THE TECHNICAL LITERATURE.	2	EA	0.000000	0.00
0003	STANDARD COMMERCIAL INSTALLATION (FURNISH AND INSTALL)	1	EA	1500.000000	1500.00

END OF SECTION B

SECTION C  
DESCRIPTION/SPECS./WORK STATEMENT

C. MINIMUM ESSENTIAL REQUIREMENTS

- C.1. Must use gamma radiation to inactivate lymphocytes in blood and blood components.
- C.1.2. The unit must be self-shielded encasing the radiation source in a double walled stainless-steel holder.
- C.1.3. The steel holder must be permanently installed and sealed in a lead encased biological shield.
- C.1.4. The system must have three to four sources of radiation with a minimum Curie content of 1800 for even irradiation.
- C.1.5. The external radiation level must meet or be below the requirements of the International Commission in Radiation Protection (ICRP#15).
- C.1.6. A 3000 radiation dose must be delivered in two to seven minutes.
- C.1.7. A turntable must be within the chamber for dose uniformity. The sample must automatically rotate towards and away from the irradiation source.
- C.1.8. A battery back up system is required to allow cycle completion in case of power failure.
- C.1.9. A key operated switch must control electrical power to the unit.
- C.1.10. The sample chamber rotor must not operate until the front door is closed.
- C.1.11. An audible alarm system must be in place to announce the end of irradiation process.
- C.1.12. The unit must be able to operate safely in a laboratory environment in accordance with ICRP#15.
- C.1.13. Dimensions must be approximately 66" high x 30" wide x 26" deep. Weight approximately 3500 pounds.
- C.1.14. On-site training must be provided for at least six people for eight hours.

END OF SECTION C

SECTION D  
PACKAGING AND MARKING

D.1 52.000-4024

PACKAGING

The supplies or equipment shall be packaged to afford adequate protection against corrosion, deterioration and damage in transit from the supply source to the receiving activity. Contractor's standard commercial packaging will be considered acceptable, provided it satisfies the above criteria.

END OF SECTION D

SECTION E  
INSPECTION AND ACCEPTANCE

E.1 52.252-0002 CLAUSES INCORPORATED BY REFERENCE (JUN 1988)

This contract incorporates the following clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their text available.

I. FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1)  
CLAUSES

II. DOD FAR SUPPLEMENT (48 CFR CHAPTER 2) CLAUSES

(End of clause)

(R 7-001)

E.2 52.246-0002 INSPECTION OF SUPPLIES--FIXED-PRICE (JUL 1985)  
(Reference 46.302)

E.3 52.246-0016 RESPONSIBILITY FOR SUPPLIES (APR 1984)  
(Reference 46.316)

E.4 52.000-4026 INSPECTION AND ACCEPTANCE AT DESTINATION

Inspections and acceptance of the supplies or services to be furnished hereunder shall be made at destination by the receiving office or consignee shown in the contract.

END OF SECTION E

SECTION F  
DELIVERIES OR PERFORMANCE

F.1 52.252-0002

CLAUSES INCORPORATED BY REFERENCE (JUN 1988)

This contract incorporates the following clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their text available.

I. FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1)  
CLAUSES

II. DOD FAR SUPPLEMENT (48 CFR CHAPTER 2) CLAUSES

(End of clause)

(R 7-001)

F.2 52.247-0034

F.O.B. DESTINATION (APR 1984)  
(Reference 47.303-6(c))

F.3 52.000-4004

CONTRACT PERIOD

This contract shall be effective AUGUST 17TH, or date of award, whichever is later, and shall continue FOR 60 DAYS, unless sooner terminated under the terms of the contract.

F.4 52.000-4025

PLACE OF DELIVERY - FOB DESTINATION

The articles to be furnished hereunder shall be delivered, all transportation charges paid by the contractor, and in accordance with FOB Destination clause (FAR 52.247-34) in Section I of this solicitation. Deliver to:

DOL, PROPERTY MANAGEMENT BRANCH  
BUILDING #178 FOREST GLEN SECTION  
2461 LINDEN LANE (WRAMC)  
SILVER SPRING, MD 20910-1291

F.5 52.000-4027

OFFERS NOT DESIGNATED AS F.O.B. DESTINATION

Offers submitted on a basis other than f.o.b. Destination may be rejected as non-responsive in accordance with FAR 47.305.4(b).

TIME OF DELIVERY (APR 1984)

(a) The Government requires delivery to be made according to the following schedule:

REQUIRED DELIVERY SCHEDULE

ITEM NO.	QUANTITY	WITHIN DAYS AFTER DATE OF CONTRACT
1 AND 3	1 EA	60
2	2 EA	60

The Government will evaluate equally, as regards time of delivery, offers that propose delivery of each quantity within the applicable delivery period specified above. Offers that propose delivery that will not clearly fall within the applicable required delivery period specified above, will be considered nonresponsive and rejected. The Government reserves the right to award under either the required delivery schedule or the proposed delivery schedule, when an offeror offers an earlier delivery schedule than required above. If the offeror proposes no other delivery schedule, the required delivery schedule above will apply.

OFFEROR'S PROPOSED DELIVERY SCHEDULE

ITEM NO.	QUANTITY	WITHIN DAYS AFTER DATE OF CONTRACT
1	1 each	60 DAYS - Items 1 & 2.
2	2 each	60 DAYS - Items 1 & 2.

Please note that the devices offered as options require 90-120

(b) Attention is directed to the Contract Award provision of the days for delivery. solicitation that provides that a written award or acceptance of offer mailed, or otherwise furnished to the successful offeror, results in a binding contract. The Government will mail or otherwise furnish to the offeror an award or notice of award not later than the day award is dated. Therefore, the offeror should compute the time available for performance beginning with the actual date of award, rather than the date the written notice of award is received from the Contracting Officer through the ordinary mails. However, the Government will evaluate an offer that proposes delivery based on the Contractor's date of receipt of the contract or notice of award by adding five days for delivery of the award through the ordinary mails. If, as so computed, the offered delivery date is later than the required delivery date, the offer will be considered nonresponsive and rejected.

(End of clause)  
 (R 7-104.92(b) 1974 APR)  
 (R 1-1.316-5)  
 (R 1-1.316-4(c))

END OF SECTION F

SECTION G  
CONTRACT ADMINISTRATION DATA

G.1 52.000-4000

CORRESPONDENCE AFTER AWARD

All correspondence after award of this contract shall be directed to the following address:

CONTRACTING OFFICER  
Directorate of Contracting  
Walter Reed Army Medical Center  
Washington, DC 20307-5000

G.2 52.000-4002 ii

INVOICING AND PAYMENT

Payment shall be made upon receipt and acceptance by the Government. Invoices shall be submitted in quadruplicate (one copy marked "original"), to the following address:

Commercial Accounts Section  
Walter Reed Army Medical Center  
Washington, DC 20307-5000

G.3 52.000-4003

CONTRACTING OFFICER'S AUTHORITY

The Contracting Officer is the ONLY person authorized to approve changes to any of the requirements under this contract, and notwithstanding any provision contained elsewhere in this contract the said authority remains solely with the Contracting Officer. In the event the Contractor effects any changes at the direction of any person other than the Contracting Officer, the change will be considered to have been made without authority, and no adjustment will be made in the contract price to cover any increase in charges incurred as a result thereof.

G.4 52.000-4522

52.232-0025 PROMPT PAYMENT (APR 1989) (AL 89-10)

Notwithstanding any other payment clause in this contract, the Government will make invoice payments and contract financing payments under the terms and conditions specified in this clause. Payment shall be considered as being made on the day a check is dated or an electronic funds transfer is made. Definitions of pertinent terms are set forth in 32.902. All days referred to in this clause are calendar days, unless otherwise specified. The term "foreign vendor" means an incorporated concern not incorporated in the United States, or an unincorporated concern having its principal place of business outside the United States.

(a) Invoice Payments.

(1) For purposes of this clause, "invoice payment" means a Government disbursement of monies to a Contractor under a contract or other authorization for supplies or services accepted by the Government. This includes payments for partial deliveries that have been accepted by the Government and final cost or fee payments where amounts owed have been settled between the Government and the Contractor.

(2) Except as indicated in subparagraph (a)(3) and paragraph (c) of this clause, the due date for making invoice payments by the designated payment office shall be the later of the following two events:

(i) The 30th day after the designated billing office has received a proper invoice from the Contractor.

(ii) The 30th day after Government acceptance of supplies delivered or services performed by the Contractor. On a final invoice where the payment amount is subject to contract settlement actions, acceptance shall be deemed to have occurred on the effective date of the contract settlement. However, if the designated billing office fails to annotate the invoice with the actual date of receipt, the invoice payment due date shall be deemed to be the 30th day after the date the Contractor's invoice is dated, provided a proper invoice is received and there is no disagreement over quantity, quality, or Contractor compliance with contract requirements.

(3) The due date on contracts for meat and meat food products, contracts for perishable agricultural commodities, contracts for dairy products, edible fats or oils, and food products prepared from edible fats or oils, and contracts not requiring submission of an invoice shall be as follows:

(i) The due date for meat and meat food products, as defined in Section 2(a)(3) of the Packers and Stockyard Act of 1921 (7 U.S.C. 182(3)) and further defined in Pub. L. 98-181 to include any edible fresh or frozen poultry meat, any perishable poultry meat food product, fresh eggs, and any perishable egg product, will be as close as possible to, but not later than, the 7th day after product delivery.

(ii) The due date for perishable agricultural commodities, as defined in Section 1(4) of the Perishable Agricultural Commodities Act of 1930 (7 U.S.C. 499a(44)), will be as close as possible to, but not later than, the 10th day after product delivery, unless another date is specified in the contract.

(iii) The due date for dairy products, as defined in section 111(e) of the Dairy Production Stabilization Act of 1983 (7 U.S.C. 4502(e)), edible fats or oils, and food products prepared from edible fats or oils, will be as close as possible to, but not later than, the 10th day after the date on which a proper invoice has been received.

(4) An invoice is the Contractor's bill or written request for payment under the contract for supplies delivered or services performed. An invoice shall be prepared and submitted to the designated billing office

specified in the contract. A proper invoice must include the items listed in subdivisions (a)(4)(i) through (a)(4)(viii) of this clause. If the invoice does not comply with these requirements, then the Contractor will be notified of the defect within 7 days after receipt of the invoice at the designated billing office (3 days for meat and meat food products and 5 days for perishable agricultural commodities, edible fats or oils, and food products prepared from edible fats or oils). Untimely notification will be taken into account in the computation of any interest penalty owed the Contractor in the manner described in subparagraph (a)(6) of this clause.

(i) Name and address of the Contractor.

(ii) Invoice date.

(iii) Contract number or other authorization for supplies delivered or services performed (including order number and contract line item number).

(iv) Description, quantity, unit of measure, unit price, and extended price of supplies delivered or services performed.

(v) Shipping and payment terms (e.g., shipment number and date of shipment, prompt payment discount terms). Bill of lading number and weight of shipment will be shown for shipments on Government bills of lading.

(vi) Name and address of Contractor official to whom payment is to be sent (must be the same as that in the contract or in a proper notice of assignment).

(vii) Name (where practicable), title, phone number and mailing address of person to be notified in event of a defective invoice.

(viii) Any other information or documentation required by other requirements of the contract (such as evidence of shipment).

(5) An interest penalty shall be paid automatically by the Government, without request from the Contractor, if payment is not made by the due date and the conditions listed in subdivisions (a)(5)(i) through (a)(5)(iii) of this clause are met, if applicable. An interest penalty shall not be paid on contracts awarded to foreign vendors outside the United States for work performed outside the United States.

(i) A proper invoice was received by the designated billing office.

(ii) A receiving report or other Government documentation authorizing payment was processed and there was no disagreement over quantity, quality, or contractor compliance with any contract term or condition.

(iii) In the case of a final invoice for any balance of funds due the Contractor for supplies delivered or services performed, the amount was not subject to further contract settlement actions between the Government and the Contractor.

(6) The interest penalty shall be at the rate established by the Secretary of the Treasury under Section 12 of the Contract Disputes Act of 1978 (41 U.S.C. 611) that is in effect on the day after the due date, except where the interest penalty is prescribed by other governmental authority. This rate is referred to as the "Renegotiation Board Interest Rate," and it is published in the Federal Register semiannually on or about January 1 and July 1. The interest penalty shall accrue daily on the

invoice payment amount approved by the Government and be compounded in 30-day increments inclusive from the first day after the due date through the payment date. That is, interest accrued at the end of any 30-day period will be added to the approved invoice payment amount and be subject to interest penalties if not paid in the succeeding 30-day period. If the designated billing office failed to notify the contractor of a defective invoice within the periods prescribed in subparagraph (a)(4) of this clause, then the due date on the corrected invoice will be adjusted by subtracting the number of days taken beyond the prescribed notification of defects period. Any interest penalty owed the Contractor will be based on this adjusted due date. Adjustments will be made by the designated payment office for errors in calculating interest penalties, if requested by the Contractor.

(i) For the sole purpose of computing an interest penalty that might be due the Contractor, Government acceptance shall be deemed to have occurred constructively on the 7th day (unless otherwise specified in this contract) after the Contractor delivered the supplies or performed the services in accordance with the terms and conditions of the contract, unless there is a disagreement over quantity, quality, or contractor compliance with a contract provision. In the event that actual acceptance occurs within the constructive acceptance period, the determination of an interest penalty shall be based on the actual date of acceptance. The constructive acceptance requirement does not, however, compel Government officials to accept supplies or services, perform contract administration functions, or make payment prior to fulfilling their responsibilities.

(ii) The following periods of time will not be included in the determination of an interest penalty:

(A) The period taken to notify the Contractor of defects in invoices submitted to the Government, but this may not exceed 7 days (3 days for meat and meat food products and 5 days for perishable agricultural commodities, dairy products, edible fats or oils, and food products prepared from edible fats or oils).

(B) The period between the defects notice and resubmission of the corrected invoice by the Contractor.

(iii) Interest penalties will not continue to accrue after the filing of a claim for such penalties under the clause at 52.233-1, Disputes, or for more than 1 year. Interest penalties of less than \$1.00 need not be paid.

(iv) Interest penalties are not required on payment delays due to disagreement between the Government and Contractor over the payment amount or other issues involving contract compliance or on amounts temporarily withheld or retained in accordance with the terms of the contract. Claims involving disputes, and any interest that may be payable, will be resolved in accordance with the clause at 52.233-1, Disputes.

(7) An interest penalty shall also be paid automatically by the designated payment office, without request from the contractor, if a discount for prompt payment is taken improperly. The interest penalty will

be calculated as described in subparagraph (a)(6) of this clause on the amount of discount taken for the period beginning with the first day after the end of the discount period through the date when the contractor is paid.

(8) If this contract was awarded on or after October 1, 1989, a penalty amount, calculated in accordance with regulations issued by the Office of Management and Budget, shall be paid in addition to the interest penalty amount if the Contractor--

(i) Is owed an interest penalty;

(ii) Is not paid the interest penalty within 10 days after the date the invoice amount is paid; and

(iii) Makes a written demand, not later than 40 days after the date the invoice amount is paid, that the agency pay such a penalty.

(b) Contract Financing Payments.

(1) For purposes of this clause, "contract financing payment" means a Government disbursement of monies to a Contractor under a contract clause or other authorization prior to acceptance of supplies or services by the Government. Contract financing payments include advance payments, progress payments based on cost under the clause at 52.232-16, Progress Payments, progress payments based on a percentage or stage of completion (32.102(e)(1)) other than those made under the clause at 52.232-5, Payments Under Fixed-Price Construction Contracts, or the clause at 52.232-10, Payments Under Fixed-Price Architect-Engineer Contracts, and interim payments on cost type contracts.

(2) For contracts that provide for contract financing, requests for payment shall be submitted to the designated billing office as specified in this contract or as directed by the Contracting Officer. Contract financing payments shall be made on the N/A day after receipt of a proper contract financing request by the designated billing office. In the event that an audit or other review of a specific financing request is required to ensure compliance with the terms and conditions of the contract, the designated payment office is not compelled to make payment by the due date specified.

(3) For advance payments, loans, or other arrangements that do not involve recurrent submissions of contract financing requests, payment shall be made in accordance with the corresponding contract terms or as directed by the Contracting Officer.

(4) Contract financing payments shall not be assessed an interest penalty for payment delays.

(c) If this contract contains the clause at 52.213-1, Fast Payment Procedures, payments will be made within 15 days after the date of receipt of the invoice.

END OF SECTION G

SECTION I  
CONTRACT CLAUSES

1.1 52.252-0002

CLAUSES INCORPORATED BY REFERENCE (JUN 1988)

This contract incorporates the following clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their text available.

I. FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1)  
CLAUSES

II. DOD FAR SUPPLEMENT (48 CFR CHAPTER 2) CLAUSES

(End of clause)

(R 7-001)

1.2 52.000-4509

52.209-7001 ACQUISITIONS FROM DEFENSE CONTRACTORS SUBJECT TO ON-SITE INSPECTION UNDER THE INTERMEDIATE-RANGE NUCLEAR FORCES (INF) TREATY (JUN 1988) (AL 88-16)  
(Reference )

1.3 52.000-4521

52.232-8 DISCOUNTS FOR PROMPT PAYMENT (APR 1989) (AL 89-10)  
(Reference )

1.4 52.202-0001

DEFINITIONS (APR 1984)  
(Reference 2.2)

1.5 52.203-0001

OFFICIALS NOT TO BENEFIT (APR 1984)  
(Reference 3.102-2)

1.6 52.203-0003

GRATUITIES (APR 1984)  
(Reference 3.202)

1.7 52.203-0005

COVENANT AGAINST CONTINGENT FEES (APR 1984)  
(Reference 3.404(c))

1.8 52.203-0006

RESTRICTIONS ON SUBCONTRACTOR SALES TO THE GOVERNMENT (JUL 1985)  
(Reference 3.503-2)

1.9 52.203-0007

ANTI-KICKBACK PROCEDURES (OCT 1988)  
(Reference 3.502-3)

1.10 52.203-7001 SPECIAL PROHIBITION ON EMPLOYMENT (APR 1987)  
(Reference 3.571-5)

1.11 52.215-0001 EXAMINATION OF RECORDS BY COMPTROLLER GENERAL (APR 1984)  
(Reference 15.106-1(b))

1.12 52.215-0002 AUDIT--NEGOTIATION (APR 1988)  
(Reference 15.106-2(b))

1.13 52.215-0033 ORDER OF PRECEDENCE (JAN 1986)  
(Reference 15.406-3(b))

1.14 52.219-0008 UTILIZATION OF SMALL BUSINESS CONCERNS AND SMALL DISADVANTAGED BUSINESS  
CONCERNS (JUN 1985)  
(Reference 19.708(a))

1.15 52.220-0003 UTILIZATION OF LABOR SURPLUS AREA CONCERNS (APR 1984)  
(Reference 20.302(a))

1.16 52.222-0020 WALSH-HEALEY PUBLIC CONTRACTS ACT (APR 1984)  
(Reference 22.610(b))

1.17 52.222-0026 EQUAL OPPORTUNITY (APR 1984)  
(Reference 22.810(e))

1.18 52.222-0035 AFFIRMATIVE ACTION FOR SPECIAL DISABLED AND VIETNAM ERA VETERANS  
(APR 1984)  
(Reference 22.1308)

1.19 52.222-0036 AFFIRMATIVE ACTION FOR HANDICAPPED WORKERS (APR 1984)  
(Reference 22.1408)

1.20 52.222-0037 EMPLOYMENT REPORTS ON SPECIAL DISABLED VETERANS AND VETERANS OF THE  
VIETNAM ERA (JAN 1988)  
(Reference 22.1308(b))

1.21 52.223-0006 DRUG-FREE WORKPLACE (MAR 1989)  
(Reference 23.505(c))

1.22 52.225-7001 BUY AMERICAN ACT AND BALANCE OF PAYMENTS PROGRAM (APR 1985)  
(Reference 25.109(d)(S))

1.23 52.225-7027 RESTRICTION ON CONTRACTING WITH TOSHIBA CORPORATION OR KONGSBERG  
VAPENFABRIKK (MARCH 1988)  
(Reference 25.7011(d))

1.24 52.227-0001 AUTHORIZATION AND CONSENT (APR 1984)  
(Reference 27.201-2(a))

1.25 52.227-0002 NOTICE AND ASSISTANCE REGARDING PATENT AND COPYRIGHT INFRINGEMENT  
(APR 1984)  
(Reference 27.202-2)

1.26 52.229-0003 FEDERAL, STATE, AND LOCAL TAXES (APR 1984)  
(Reference 29.401-3)

1.27 52.229-0005 TAXES--CONTRACTS PERFORMED IN U.S. POSSESSIONS OR PUERTO RICO (APR 1984)  
(Reference 29.401-5)

1.28 52.232-0001 PAYMENTS (APR 1984)  
(Reference 32.111(a)(1))

1.29 52.232-0011 EXTRAS (APR 1984)  
(Reference 32.111(d)(2))

1.30 52.232-0017 INTEREST (APR 1984)  
(Reference 32.617(a))

1.31 52.232-0023 ASSIGNMENT OF CLAIMS (JAN 1986)  
(Reference 32.806(a)(1))

- 1.32 52.233-0001      DISPUTES (APR 1984)  
(Reference 33.214)
- 1.33 52.233-0003      PROTEST AFTER AWARD (JUN 1985)  
(Reference 33.106(b))
- 1.34 52.243-0001      CHANGES--FIXED-PRICE (AUG 1987)  
(Reference 43.205(a)(1))
- 1.35 52.243-7001      PRICING OF ADJUSTMENTS (APR 1984)  
(Reference 43.205(S-71))
- 1.36 52.249-0001      TERMINATION FOR CONVENIENCE OF THE GOVERNMENT (FIXED-PRICE) (SHORT FORM)  
(APR 1984)  
(Reference 49.502(a)(1))
- 1.37 52.249-0008      DEFAULT (FIXED-PRICE SUPPLY AND SERVICE) (APR 1984)  
(Reference 49.504(a)(1))
- 1.38 52.000-4525      52.209-6 PROTECTING THE GOVERNMENT'S INTEREST WHEN SUBCONTRACTING  
WITH CONTRACTORS DEBARRED, SUSPENDED, OR PROPOSED FOR DEBARMENT  
(MAY 1989) (FAC 84-46)

END OF SECTION I

MATERIALS LICENSE

Amendment No. 19

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		In accordance with application dated July 16, 1990,	
1. Department of the Army Walter Reed Army Medical Center		3. License number 08-01738-03 is amended in its entirety to read as follows:	
2. Washington, D. C. 20307-5001		4. Expiration date May 31, 1991	
		5. Docket or Reference No. 030-06895	
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. Cobalt 60	A. Sealed sources (AECL Models C-166, C-167 or C-198)	A. 2 sources not exceed 16,000 curies each	
B. Cesium 137	B. Sealed sources (AECL Model C-161 Type 8)	B. 2 sources not to exceed 2,100 curies each	
C. Cobalt 60	C. Sealed sources (AECL Model C-198)	C. 2 sources not to exceed 26,400 curies each	
D. Cesium 137	D. Sealed sources (AECL Model C-161 Type 8)	D. 2 sources not to exceed 2,100 curies each	
E. Cesium 137	E. Sealed sources		
9. Authorized use			
A. To be used in AECL Gammacell 220 irradiator for medical research and development and radiation dosimetry.			
B. To be used in AECL Gammacell 40 Irradiator for small animal irradiation, medical research, development and radiation dosimetry.			
C. To be used in AECL Gammacell 220 Irradiator for medical research and development and radiation dosimetry.			
D. To be used in AECL Gammacell 40 Irradiator for medical research and development and radiation dosimetry.			
E. To be used in a ] irradiator to irradiate blood products.			

CONDITIONS

10. Licensed material shall be used at WRAMC, Washington, D.C., and USAMRILD, Fort Detrick, Maryland.

Information in this record was deleted in accordance with the Freedom of Information Act, exemptions 2B, 6, 7C, 7D, 7E, 7F, 7G, 7H, 7I, 7J, 7K, 7L, 7M, 7N, 7O, 7P, 7Q, 7R, 7S, 7T, 7U, 7V, 7W, 7X, 7Y, 7Z, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.

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ML 10

EX 2

JJ/4

**MATERIALS LICENSE  
SUPPLEMENTARY SHEET**

License number	08-01738-03
Docket or Reference number	030-06895
Amendment No. 19	

(Continued)

**CONDITIONS**

11. A. Licensed material shall be used by individuals designated by the individual approved by the Radiation Control Committee.
- B. The Radiation Safety Officer for this license is Peter H. Myers.
12. Sealed sources containing licensed material shall not be opened.
13. A. Sealed sources and detector cells shall be tested for leakage and/or contamination at intervals not to exceed 6 months or at such other intervals as are specified by the certificate of registration referred to in 10 CFR 32.210, not to exceed 3 years.
- B. Notwithstanding Paragraph A of this Condition, sealed sources designed to emit alphaparticles shall be tested for leakage and/or contamination at intervals not to exceed 3 months.
- C. In the absence of a certificate from a transferor indicating that a 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.
- E. Sealed sources and detector cells need not be leak tested if:
  - (i) they contain only hydrogen 3; or
  - (ii) they contain only krypton 85; 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.

**MATERIALS LICENSE  
SUPPLEMENTARY SHEET**

License number

08-01738-03

Docket or Reference number

030-06895

Amendment No. 19

(13. continued)

**CONDITIONS**

- F. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. Records of leak test results shall be kept in units of microcuries and shall be maintained for inspection by the Commission. 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 shall be removed from service and decontaminated, repaired, or disposed of in accordance with Commission regulations. The report shall be filed within 5 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 involved, the test results, and corrective action taken.
- G. The licensee is authorized to collect leak test samples for analysis by individuals approved by the Radiation Control Committee. 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.
14. 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 a person specifically licensed by the Commission or an Agreement State to perform such services.
15. Written instructions contained in application dated May 17, 1985 shall be followed and a copy of these instructions shall be made available to each individual using or having responsibility for use of licensed material. Any changes to these instructions shall have the prior approval of the U.S. Nuclear Regulatory Commission, Region I, ATTN: Chief, Nuclear Materials Safety Branch, 475 Allendale Road, King of Prussia, Pennsylvania 19406.

**MATERIALS LICENSE  
SUPPLEMENTARY SHEET**

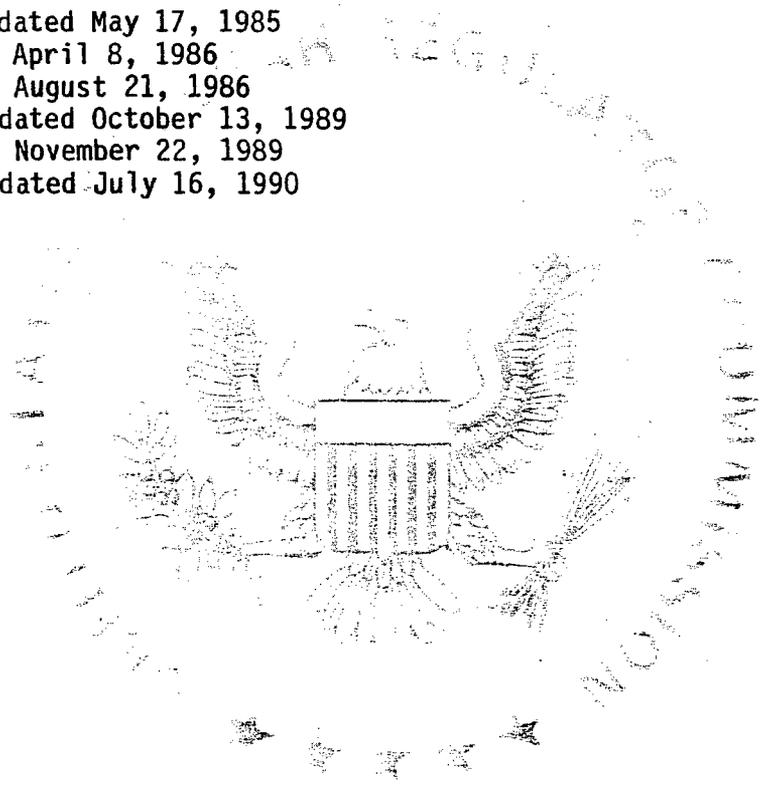
License number	08-01738-03
Docket or Reference number	030-06895
Amendment No. 19	

(Continued)

**CONDITIONS**

16. 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 May 17, 1985
- B. Letter dated April 8, 1986
- C. Letter dated August 21, 1986
- D. Application dated October 13, 1989
- E. Letter dated November 22, 1989
- F. Application dated July 16, 1990



For the U.S. Nuclear Regulatory Commission

Original Signed By:

By Thomas K. Thompson

Nuclear Materials Safety Branch  
Region I

King of Prussia, Pennsylvania 19406

JAN 08 1991

Date \_\_\_\_\_

JAN 08 1991

License No. 08-01738-03  
Docket No. 030-06895  
Control No. 112880

Department of the Army  
ATTN: LTC (P) Charles E. Day, III  
HQDA (SGPS-PSP-E)  
5109 Leesburg Pike  
Falls Church, Virginia 22041-3258

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.

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ML 08-01738-03/LTR - 0001.0.0  
01/04/91

**ML 10**

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

Sincerely,

**Original Signed By:**

**Thomas K. Thompson**  
Thomas K. Thompson  
Nuclear Materials Safety Section C  
Division of Radiation Safety  
and Safeguards

Enclosures:

1. Amendment No. 19
2. Requirements for Materials Licensees
3. Regulatory Guide 10.9

DRSS:RI  
G. Roberts  
*GER*  
1/4/91

DRSS:RI  
Thompson  
1/ /91

CONVERSATION RECORD

TIME 11-7-90

DATE 9:10

TYPE

VISIT

CONFERENCE

TELEPHONE

INCOMING

OUTGOING

ROUTING

NAME/SYMBOL

INT

Location of Visit/Conference:

*Return call*

NAME OF PERSON(S) CONTACTED OR IN CONTACT WITH YOU

ORGANIZATION (Office, dept., bureau, etc.)

TELEPHONE NO.:

LTC L.E. Piper

*Army*

SUBJECT

MC 11288D

*Amend.*

SUMMARY

WRAMC location contained in last amendment (letter dated 10-13-89). Description of location & security included.

LTC Piper confirmed that the entire hospital was equipped w/ sprinkle system for fires, extinguishers, hoses, etc.

ACTION REQUIRED

NAME OF PERSON DOCUMENTING CONVERSATION

SIGNATURE

DATE

*William Roberts*

11-7-90

ACTION TAKEN

SIGNATURE

TITLE

DATE



REPLY TO  
ATTENTION OF

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

030-06895



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 08-01738-03, Walter Reed Army Medical  
Center, Washington, DC.

Recommend approval.

Sincerely,

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

Enclosure

112880

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JUL 19 1990



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

REPLY TO  
ATTENTION OF:

HSHL-H-HP (385-11m)

MEMORANDUM THRU

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

*Robert Chey*  
LTC, MS  
3 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. 08-01738-03

1. Request that NRC License No. 08-01738-03 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). LTC Myers was present when our most recent irradiator from J. L. Shepherd was delivered and attended the training session they provided on its safe operation and maintenance.

2. The address where licensed material shall be used (listed in item 10) needs to include Walter Reed Army Medical Center (WRAMC) Washington D.C.. The new irradiator is in the hospital itself while the two irradiators previously listed are at WRAIR (Walter Reed Army Institute of Research) which is also on the main Walter Reed Post. WRAIR could be considered part of WRAMC but not the other way around.

FOR THE COMMANDER:

2 Encls

*Llewellyn E. Piper*  
LLEWELLYN E. PIPER  
LTC, MS  
Executive Officer

FEE EXEMPT

**TRAINING AND EXPERIENCE  
F AUTHORIZED RADIOISOTOPE USERS**

1. NAME OF AUTHORIZED USER (Last, First, MI)  <b>MYERS, Peter H.</b>	2. STATE OR TERRITORY IN WHICH LICENSED:  (MD, DDS, DVM, etc.)
--	--

RANK/GRADE  <b>LTC</b>	ORGANIZATION  <b>WRAMC</b>	ORGANIZATIONAL DIVISION <b>Health Physics Office</b>	BLDG./ROOM NO.  <b>Bld 188, FGS, WRAMC</b>	WRAMC AUTHORIZATION NO.  <b>221</b>
------------------------------	----------------------------------	---	--	---

**3. CERTIFICATION**

SPECIALTY BOARD A	CATEGORY B	MONTH AND YEAR CERTIFIED C
N/A	N/A	N/A

**4. FORMAL EDUCATION                      HIGHEST ACADEMIC DEGREE ATTAINED**

Higher Educational Institutions Attended	Type of Program Pursued and Dates of Attendance	Degree, Diploma or Certificate Received and Date
a. <u>Texas A&amp;M University</u>	<u>MS, Biophysics (Rad Hlth)</u>	<u>MS, Biophysics (Rad Hlth)</u>
b. <u>University of Kansas</u>	<u>BA. Biology (Env. Hlth)</u>	<u>BA. Biology (Env Hlth)</u>
c. _____	_____	_____
d. _____	_____	_____

**5. TRAINING RECEIVED IN BASIS RADIOISOTOPE HANDLING TECHNIQUES**

FIELD OF TRAINING A	LOCATION AND DATE(S) OF TRAINING (Include course title if known) B	TYPE AND LENGTH OF TRAINING	
		LECTURE/ LABORATORY COURSES (Hours) C	SUPERVISED LABORATORY EXPERIENCE (Hours) D
a. RADIATION PHYSICS AND INSTRUMENTATION	Applied Hlth Phys Crse Oak Ridge Nat'l Lab, TN June 1978	60	20
b. RADIATION PROTECTION	Applied Hlth Phys Crse Oak Ridge Nat'l Lab, TN June 1978	60	20
c. MATHEMATICS PERTAINING TO THE USE AND MEASUREMENT OF RADIOACTIVITY	Applied Hlth Phys Crse ORAU, TN June 1978	15	5
d. RADIATION BIOLOGY	Applied Hlth Phys Crse ORAU, TN	15	5
e. RADIOPHARMACEUTICAL CHEMISTRY			

*Ex 6*

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 QJT -- (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)

P. N. Myers

(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 6

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,

*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

EX 6



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  
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-8	CPT(P) Connock
1100-1150	Nuc Med Sci Officers in the Field LUNCH	
1300-1330	AFFRI Orientation	COL Adcock/MAJ Hagan
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 LUNCH	LTC Field
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 LUNCH	John Villforth
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 LUNCH	MAJ Day
1315-1630	Out-Processing Sign-Out	SM SDO & SDNCO

# UNITED STATES AIR FORCE



*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

A handwritten signature in black ink, appearing to read "Bobby R. Adcock".

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.

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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	ROOM
Monday, May 30	8:00 AM	Welcome, Registration, Orientation	Beck/Kent	E-4
	9:00 AM	ATOMIC AND NUCLEAR STRUCTURE	PAULSON	E-4
	11:00 AM	Math Review	Beck	E-4
	1:00 PM	INTRODUCTION TO RADIOACTIVITY	PAULSON	E-4
	2:30	COMPUTER ORIENTATION	GLEASON	W-14
Tuesday, May 31	8:00 AM	MODES AND RATES OF DECAY	PAULSON	E-4
	9:30 AM	Lab: Computational Techniques	Beck	E-4
	10:30 AM	COUNTING STATISTICS	GLEASON	E-4
	1:00 PM	PARTICLE INTERACTIONS	PAULSON	E-4
	2:30 PM	GAS DETECTORS: G-M COUNTERS	BECK	E-4
	3:30 PM	Lab: HP-1 Laboratory Techniques	Kent/Auxier	W-19
Wednesday, June 1	8:00 AM	GAMMA INTERACTIONS	PAULSON	E-4
	9:30 AM	Lab: HP-2 G-M Counting	Auxier/Beck	W-19
	1:00 PM	GAS DETECTORS: PROPORTIONAL COUNTERS	KENT	E-4
	2:30 PM	Lab: HP-3 Beta Characteristics	Auxier/Paulson	W-19
Thursday, June 2	8:00 AM	QUANTITIES AND UNITS I	BECK	E-4
	9:30 AM	Review & Problem Session	Kent	E-4
	10:30 AM	GAS DETECTORS: IONIZATION CHAMBERS	KENT	E-4
	1:00 PM	SCINTILLATION SPECTROMETRY I	GLEASON	E-4
	2:30 PM	Lab: HP-8 Proportional Counting	Beck/Kent	W-19
Friday, June 3	8:00 AM	QUANTITIES AND UNITS II	BECK	E-4
	9:30 AM	Review and Quiz	Beck/Kent	E-4
	10:30 AM	SCINTILLATION SPECTROMETRY II	GLEASON	E-4
	1:00 PM	BIOLOGY REVIEW	GIST	E-4
	2:30 PM	Lab: HP-5 Gamma Ray Spectrometry	Gleason	W-19

## APPLIED HEALTH PHYSICS

June 5 - 10, 1977

SECOND WEEK

DATE	TIME	TOPIC	LECTURER	ROOM
Monday, June 6	8:00 AM	SCINTILLATION SPECTROMETRY III	GLEASON	E-4
	9:30 AM	Lab: HP-6 Multichannel Analyzer	Paulson/Gleason	W-1
	1:00 PM	RADIATION BIOLOGY I	CLOUTIER	E-4
	2:30 PM	Lab: HP-45 Bio. Effects of Radiation	Gist/Auxier	E-9
Tuesday, June 7	8:00 AM	LIQUID SCINTILLATION COUNTERS	GIST	E-4
	9:30 AM	Lab: HP-20 Liquid Scintillation Counters	Gist/Kent	W-1
	1:00 PM	RADIATION BIOLOGY II	CLOUTIER	E-4
	2:30 PM	RADIATION PROTECTION GUIDES I	BECK	E-4
Wednesday, June 8	8:00 AM	X-RAY PRODUCTION AND CHARACTERISTICS	CLOUTIER	E-4
	9:30 AM	Review and Problem Session	Kent	E-4
	10:30 AM	SHIELDING I	BECK	E-4
	1:00 PM	SHIELDING II	KENT	E-4
	2:30 PM	Lab: HP-18 Shielding	Kent/Beck	W-1
Thursday, June 9	8:00 AM	RADIATION PROTECTION GUIDES II	BECK	E-4
	9:30 AM	ACUTE EFFECTS OF RADIATION	ANDREWS	E-4
	10:45 AM	Shielding Evaluation Problem	Kent	E-4
	1:00 PM	IONIZATION SURVEY INSTRUMENTS	KENT	E-4
	2:30 PM	Lab: HP-13 Ionization Survey Meter Characteristics	Beck/Kent	E-4
Friday, June 10	8:00 AM	GEIGER-MUELLER SURVEY INSTRUMENTS	BECK	E-4
	9:00 AM	Lab: HP-21 Condenser R Meter	Beck/Kent	MED
	11:00 AM	Review and Quiz	Beck/Kent	E-4
	1:00 PM	SOURCES OF HEALTH PHYSICS INFORMATION	BECK	E-4
	2:00 PM	Lab: HP-14 G-M Survey Instruments	Beck/Kent	E-4

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) $\gamma$ Scintillation Instruments	Beck	E-4
		(B) $\alpha$ Instruments	Kent	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) $\gamma$ Scintillation Instruments	Beck	E-4	
	(A) $\alpha$ Instruments	Kent	E-4	
Tuesday, June 14	8:00 AM	STANDARDIZATION	GLEASON	E-4
	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 <sub>3</sub> Detectors	Beck	W-15
(B) HP-16 Neutron Survey Instruments		Kent	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 <sub>3</sub> Detectors	Beck	W-15
(A) HP-16 Neutron Survey Instruments		Kent	E.B.	
Thursday, June 16	8:00 AM	THERMOLUMINESCENT DOSIMETRY	BECK	E-4
	9:30 AM	Lab: (A) HP-25 Thermoluminescent Dosimetry	Beck	W-1
		(B) HP-22 Film Dosimetry	Kent	W-14
	1:00 PM	INTERNAL DOSIMETRY I	CLOUTIER	E-4
2:30 PM	Lab: (B) HP-25 Thermoluminescent Dosimetry	Beck	W-1	
	(A) HP-22 Film Dosimetry	Kent	W-14	
Friday, June 17	8:00 AM	INTERNAL DOSIMETRY II	CLOUTIER	E-4
	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-15
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-14
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-15 W-14
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-15 W-14
	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-15 E.B.
	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.B. W-15

APPLIED HEALTH PHYSICS

June 27 - July 1, 1977

FIFTH WEEK

DATE	TIME	TOPIC	LECTURER	ROOM
Monday, June 27	8:00 AM	WATER SAMPLING AND ANALYSIS		E-4
	9:30 AM	Lab: (B) Decontamination	Beck/Kent	W-19
	1:00 PM	CONTAMINATION & SMEAR SURVEYS	BERGER	E-4
	2:30 PM	Lab: (A) HP-33 Decontamination (B) HP-37 Water Analysis	Beck/Kent Kent/Beck	W-19 W-19
Tuesday, June 28	8:00 AM	LOW LEVEL COUNTING	GLEASON	E-4
	9:30 AM	Lab: HP-12 Low Level Counting	Gleason/Paulson	W-19
	1:00 PM	CRITICALITY SAFETY		E-4
	2:30 PM	Lab: Practice Survey	Beck/Kent	E-4
Wednesday, June 29	8:00 AM	WASTE DISPOSAL	BERGER	E-4
	9:30 AM	Review and Problem Session	Kent	E-4
	11:00 AM	X-RAY FLUORESCENCE	PAULSON	E-4
	1:00 PM	TRANSPORTATION		E-4
	2:30 PM	Lab: (A) HP-47 X-Ray Fluorescence	Paulson/Gleason	E.B
Thursday, June 30	8:00 AM	SEALED SOURCE DESIGN AND TESTING	BERGER	E-4
	9:30 AM	LICENSING REGULATIONS	BECK/BERGER Cloutier/Kent	E-4
	1:00 PM	PUBLIC INFORMATION	ALEXANDER	E-4
	2:00 PM	Field Exercise	Beck/Kent	E-4
Friday, July 1	8:00 AM	Critique	Beck/Kent	E-4
	9:00 AM	Final Exam	Beck/Kent	E-4
	10:00 AM	HEALTH PHYSICS CHALLENGES	CLOUTIER	E-4
	11:00 AM	Commencement	Beck/Kent	E-4
	12:00 M	END OF COURSE		



# 1990 HEALTH PHYSICS CERTIFICATION EXAMINATION PREPARATION COURSE

## Preliminary Schedule

<u>Date</u>	<u>Topic</u>	<u>Assignment</u>
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 &amp; 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 &amp; Film Dosimetry</u> Eric E. Kearsley, 301-295-5414	Cember, pp 257-262 Exam 28: 11 & 13
Mar 8	<u>Instrumentation &amp; 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
Arnaudo	Joseph	FDA	1390 Piccard Dr.	Rockville	MD 20850	427-1050
Burchanowski	John	Army	STRBE-VR	Ft. Belvoir	VA 22060	664-5437
Casper	Larry	NRC		Washington	DC 20555	492-0573
Clark	James	NIST	Bldg 235, Rm A132	Rockville	MD 20899	975-8516
Dolce	Kathleen	NIN	9000 Rockville Pk	Bethesda	MD 20892	496-574
Doranus	Steven	Naval Med. C.		Bethesda	MD 20814	295-5422
Feraz	Yavar	MUS	910 Clopper Rd	Gaithersburg	MD 20877	258-8750
Fenton	Norm	NPSI	4 Research Pl #140	Rockville	MD 20850	670-1818
Haapala	Marvin		1307 Lake Elm Dr.	Billings	MT 59105	(406)259-4443
Hill	Dan	NPSI	4 Research Pl #140	Rockville	MD 20850	(800)969-6774
Kerns	Kenneth	DNA/AFRR1		Bethesda	MD 20814-5145	295-2299
Krueger	Suzanne	K-G HP	8114 Sandpiper Cr	Baltimore	MD 21236	529-4440
LeVake	Thomas	NIN	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.	Joppa	MD 21085	679-8528
Mengers	Timothy	NIST	Bldg 235 Rm A106	Gaithersberg	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
Nurmark	Neil	ERC Env.	321 Germantown Rd.	Fairfax	VA 22030	246-0421
Orlando	Nick	NPSI	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
Schluster	Janet	NRC	Mail Stop 6-N-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
Zaruba	Loren	CDRH	1390 Piccard Dr.	Rockville	MD 20850	427-1050

MATERIALS LICENSE

Amendment No. 20

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.

<p>Licensee</p> <ol style="list-style-type: none"> <li>Department of the Army Walter Reed Army Medical Center</li> <li>Washington, D. C. 20307-5001</li> </ol>	<p>In accordance with application dated March 18, 1991,</p> <ol style="list-style-type: none"> <li>License number 08-01738-03 is amended in its entirety to read as follows:</li> <li>Expiration date November 30, 1996</li> <li>Docket or Reference No 030-06895</li> </ol>
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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. Cobalt 60	A. Sealed sources (AECL Models C-166, C-167 or C-198)	A. 2 sources not to exceed 16,000 curies each
B. Cesium 137	B. Sealed sources (AECL Model C-161 Type 8)	B. 2 sources not to exceed 2,100 curies each
C. Cobalt 60	C. Sealed sources (AECL Model C-198)	C. 2 sources not to exceed 26,400 curies each
D. Cesium 137	D. Sealed sources (AECL Model C-161 Type 8)	D. 2 sources not to exceed 2,100 curies each
E. Cesium 137	E. Sealed sources	E. [ ]

<p>9. Authorized use</p> <ol style="list-style-type: none"> <li>To be used in AECL Gammacell 220 irradiator for medical research and development and radiation dosimetry.</li> <li>To be used in AECL Gammacell 40 Irradiator for small animal irradiation, medical research, development and radiation dosimetry.</li> <li>To be used in AECL Gammacell 220 Irradiator for medical research and development and radiation dosimetry.</li> <li>To be used in AECL Gammacell 40 Irradiator for medical research and development and radiation dosimetry.</li> <li>To be used in a [ ] irradiator to irradiate blood products.</li> </ol>
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CONDITIONS

10. Licensed material shall be used at WRAMC, Washington, D.C., and USAMRIID, Fort Detrick, Maryland.

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

FOIA 2006-0238

OFFICIAL RECORD COPY ML 10

JJB

Ex 2

**MATERIALS LICENSE  
SUPPLEMENTARY SHEET**

License number	08-01738-03
Docket or Reference number	030-06895
Amendment No. 20	

(Continued)

**CONDITIONS**

11. A. Licensed material shall be used by individuals who have satisfactorily completed the training program outlined in the application dated March 18, 1991 and have been designated by the individual approved by the Radiation Control Committee. Records of training shall be maintained by the licensee.
- B. The Radiation Safety Officer for this license is Peter H. Myers.
12. Sealed sources containing licensed material shall not be opened.
13. A. Sealed sources and detector cells shall be tested for leakage and/or contamination at intervals not to exceed 6 months or at such other intervals as are specified by the certificate of registration referred to in 10 CFR 32.210, not to exceed 3 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 3 months.
- C. In the absence of a certificate from a transferor indicating that a 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.
- E. Sealed sources and detector cells need not be leak tested if:
  - (i) they contain only hydrogen 3; or
  - (ii) they contain only a 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.

MATERIALS LICENSE  
SUPPLEMENTARY SHEET

License number

08-01738-03

Docket or Reference number

030-06895

Amendment No. 20

(13. continued)

CONDITIONS

F. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. Records of leak test results shall be kept in units of microcuries and shall be maintained for inspection by the Commission. 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 shall be removed from service and decontaminated, repaired, or disposed of in accordance with Commission regulations. The report shall be filed within 5 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 involved, the test results, and corrective action taken.

G. The licensee is authorized to collect leak test samples for analysis by individuals approved by the Radiation Control Committee. 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.

14. 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 a person specifically licensed by the Commission or an Agreement State to perform such services.

15. 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 March 18, 1991

For the U.S. Nuclear Regulatory Commission

Original Signed By:  
Paul D. Swetland

Date DEC 10 1991

By Nuclear Materials Safety Branch  
Region I  
King of Prussia, Pennsylvania 19406

DEC 10 1991

License No. 08-01738-03  
Docket No. 030-06895  
Control No. 114338

Department of the Army  
ATTN: Llewellyn E. Piper, Lt. Col.  
Walter Reed Army Medical Center  
ATTN: HSHL-HP  
Washington, D.C. 20307-5001

Dear Sir:

Please find enclosed the renewal of 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.

Department of the Army

2

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

Sincerely,

Original Signed By:  
Paul D. Swetland

Paul Swetland  
Industrial Applications Section C  
Division of Radiation Safety  
and Safeguards

Enclosure: Requirements for Materials Licensees

*RAM*  
DRSS:RI  
McGrath/rmc  
11/13/91

*PS*  
DRSS:RI  
Swetland  
11/30/91

OFFICIAL RECORD COPY

ML 08-01738-03/LTR - 0002.0.0  
11/08/91



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION I  
475 ALLENDALE ROAD  
KING OF PRUSSIA, PENNSYLVANIA 19406

APR 15 1991

Docket No. 030-06895

License No. 08-01738-03

Control No. 114338

Department of the Army  
Walter Reed Army Medical Center  
HSHL-HP  
ATTN: Llewellyn E. Piper  
Lieutenant Colonel  
Washington, D.C. 20307-5001

Gentlemen:

SUBJECT: LICENSE RENEWAL APPLICATION

This is to acknowledge receipt of your application for renewal of material(s) license identified above. Your application is deemed timely filed, and accordingly, the license will not expire until final action has been taken by this office.

Any correspondence regarding the renewal application should reference the control number specified above.

Sincerely,

**Original Signed By:**  
**Sheryl Villar**

Sheryl Villar, Chief  
Licensing Assistant Section  
Division of Radiation Safety and  
Safeguards

ML 10  
4/15/91  
**OFFICIAL RECORD COPY** ML 10

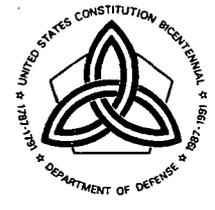


REPLY TO  
ATTENTION OF

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

030-06895

X



March 18, 1991

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 renew in its entirety Byproduct Material License Number 08-01738-03, Walter Reed Army Medical Center, Washington, DC. The application supersedes all materials referenced under Condition 16 of the current license.

Recommend approval.

Sincerely,

*Charles E. Day, III*

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

Enclosure

21 MAR 21 1991

RECEIVED

114338



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

REPLY TO  
ATTENTION OF:

HSHL-H-HP (385-11m)

March 7, 1991

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

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

SUBJECT: Renewal of US Nuclear Regulatory Commission License No.  
08-01738-03

Enclosed is the renewal application for Walter Reed Army Medical  
Center for NRC Materials License No. 08-01738-03. This  
application for dry cell irradiators includes two irradiators at  
USAMRIID, Ft. Detrick which have been included on the Walter Reed  
license in the past. USAMRIID has recently received an NRC broad  
scope license of their own, and are in the process of applying  
for an irradiator license, at which time these irradiators will  
be transferred to their license and that location deleted from  
our license.

FOR THE COMMANDER:

6 Encls

  
LLEWELLYN E. PIPER  
LTC, MS  
Executive Officer

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

# APPLICATION FOR MATERIAL LICENSE

**INSTRUCTIONS:** SEE THE APPROPRIATE LICENSE APPLICATION GUIDE FOR DETAILED INSTRUCTIONS FOR COMPLETING APPLICATION. SEND TWO COPIES OF THE ENTIRE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW.

**APPLICATIONS FOR DISTRIBUTION OF EXEMPT PRODUCTS FILE APPLICATIONS WITH:**

U.S. NUCLEAR REGULATORY COMMISSION  
DIVISION OF INDUSTRIAL AND MEDICAL NUCLEAR SAFETY, NMSS  
WASHINGTON, DC 20555

**ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS, IF YOU ARE LOCATED IN:**

**CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, MAINE, MARYLAND, MASSACHUSETTS, NEW HAMPSHIRE, NEW JERSEY, NEW YORK, PENNSYLVANIA, RHODE ISLAND, OR VERMONT, SEND APPLICATIONS TO:**

U.S. NUCLEAR REGULATORY COMMISSION, REGION I  
NUCLEAR MATERIALS SAFETY SECTION B  
475 ALLENDALE ROAD  
KING OF PRUSSIA, PA 19406

**ALABAMA, FLORIDA, GEORGIA, KENTUCKY, MISSISSIPPI, NORTH CAROLINA, PUERTO RICO, SOUTH CAROLINA, TENNESSEE, VIRGINIA, VIRGIN ISLANDS, OR WEST VIRGINIA, SEND APPLICATIONS TO:**

U.S. NUCLEAR REGULATORY COMMISSION, REGION II  
NUCLEAR MATERIALS SAFETY SECTION  
101 MARIETTA STREET, SUITE 2900  
ATLANTA, GA 30323

**IF YOU ARE LOCATED IN:**

**ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR WISCONSIN, SEND APPLICATIONS TO:**

U.S. NUCLEAR REGULATORY COMMISSION, REGION III  
MATERIALS LICENSING SECTION  
799 ROOSEVELT ROAD  
GLEN ELLYN, IL 60137

**ARKANSAS, COLORADO, IDAHO, KANSAS, LOUISIANA, MONTANA, NEBRASKA, NEW MEXICO, NORTH DAKOTA, OKLAHOMA, SOUTH DAKOTA, TEXAS, UTAH, OR WYOMING, SEND APPLICATIONS TO:**

U.S. NUCLEAR REGULATORY COMMISSION, REGION IV  
MATERIAL RADIATION PROTECTION SECTION  
611 RYAN PLAZA DRIVE, SUITE 1000  
ARLINGTON, TX 76011

**ALASKA, ARIZONA, CALIFORNIA, HAWAII, NEVADA, OREGON, WASHINGTON, AND U.S. TERRITORIES AND POSSESSIONS IN THE PACIFIC, SEND APPLICATIONS TO:**

U.S. NUCLEAR REGULATORY COMMISSION, REGION V  
NUCLEAR MATERIALS SAFETY SECTION  
1450 MARIA LANE, SUITE 210  
WALNUT CREEK, CA 94596

**PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSED MATERIAL IN STATES SUBJECT TO U.S. NUCLEAR REGULATORY COMMISSION JURISDICTION.**

**1. THIS IS AN APPLICATION FOR (Check appropriate item)**

- A. NEW LICENSE
- B. AMENDMENT TO LICENSE NUMBER \_\_\_\_\_
- C. RENEWAL OF LICENSE NUMBER 08-01738-03

**NAME AND MAILING ADDRESS OF APPLICANT (Include Zip Code)**

Department of the Army  
Walter Reed Army Medical Center  
ATTN: HSHL-H-HP  
Washington, DC 20307-5001

**3. ADDRESS(ES) WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED.**

Walter Reed Army Medical Center and Walter Reed Army Institute of Research, Washington, DC 20307-5001; US Army Medical Research Institute for Infectious Diseases, Ft. Detrick, Frederick, MD 21701

**4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION**

**PETER H. MYERS, LTC, MS, Chief, Health Physics Office, WRAMC**

**TELEPHONE NUMBER**

**(301) 427-5104**

**SUBMIT ITEMS 5 THROUGH 11 ON 8 1/2 x 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.**

<p><b>5. RADIOACTIVE MATERIAL</b> a. Element and mass number, b. chemical and/or physical form, and c. maximum amount which will be possessed at any one time.</p>	<p><b>6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.</b></p>
<p><b>7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING AND EXPERIENCE.</b></p>	<p><b>8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.</b></p>
<p><b>9. FACILITIES AND EQUIPMENT.</b></p>	<p><b>10. RADIATION SAFETY PROGRAM.</b></p>
<p><b>11. WASTE MANAGEMENT.</b></p>	<p><b>12. LICENSEE FEES (See 10 CFR 170 and Section 170.31)</b> Exception(10CFR) FEE CATEGORY <b>7B</b> AMOUNT ENCLOSED \$ <b>170.11(a)(5)</b></p>

**13. CERTIFICATION. (Must be completed by applicant) THE APPLICANT UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BINDING UPON THE APPLICANT.**  
THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT, NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PARTS 30, 32, 33, 34, 35, AND 40 AND THAT ALL INFORMATION CONTAINED HEREIN, IS TRUE AND CORRECT TO THE BEST OF THEIR KNOWLEDGE AND BELIEF.

**WARNING: 18 U.S.C. SECTION 1001 ACT OF JUNE 25, 1948, 62 STAT. 749 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.**

SIGNATURE—CERTIFYING OFFICER 	TYPED/PRINTED NAME <b>RICHARD D. CAMERON, MG, MC</b>	TITLE <b>COMMANDING GENERAL</b>	DATE
--	---	------------------------------------	------

**FOR NRC USE ONLY**

TYPE OF FEE	FEE LOG	FEE CATEGORY	COMMENTS
AMOUNT RECEIVED	CHECK NUMBER	FEE EXEMPT	

APPROVED BY _____	DATE _____
-------------------	------------

Continuation of NRC Form 313 (Items 5 - 11)

Item 5. Radioactive Material

- Irradiator #1 Cobalt 60, sealed sources in AECL Model C-166, C-167 or C-198. Maximum activity in irradiator 26,400 Ci, maximum possessed at one time 52,800 Ci.
- Irradiator #2 Cesium 137, 2 sealed sources of maximum 2,100 Ci in AECL Model C-161, Type 8. Maximum activity in irradiator 4,200 Ci, maximum possessed at one time 8,400 Ci.
- Irradiator #3 Cobalt 60, sealed sources in AECL Model C-198. Maximum activity in irradiator 26,400 Ci, maximum possessed at one time 52,800 Ci.
- Irradiator #4 Cesium 137, 2 sealed sources of maximum 2,100 Ci, in AECL Model C-161, Type 8. Maximum activity in irradiator 4,200 Ci, maximum possessed at one time 8,400 Ci.
- Irradiator #5 Cesium 137, 4 sealed sources of maximum in [ ] Maximum activity in irradiator [ ] possessed at one time [ ] maximum [ ]

Item 6. Purposes for which licensed material will be used.

- Irradiator #1 To be used in AECL Gammacell 220 irradiator located at WRAIR, Washington, DC, for medical research and development, and radiation dosimetry.
- Irradiator #2 To be used in AECL Gammacell 40 irradiator located at WRAIR, Washington, DC, for small animal irradiation, medical research and development, and radiation dosimetry.
- Irradiator #3 To be used in AECL Gammacell 220 irradiator located at USAMRIID, Ft. Detrick, Frederick, MD, for medical research and development, radiation dosimetry, and inactivation of viruses.
- Irradiator #4 To be used in AECL Gammacell 40 irradiator located at USAMRIID, Ft. Detrick, Frederick, MD, for medical research and development, radiation dosimetry, and inactivation of viruses.
- Irradiator #5 To be used in [ ] irradiator located at WRAMC, Washington, DC, for irradiation

of blood products for transfusion, to kill lymphocytes in blood products to prevent Graft versus Host disease.

Item #7 Individual responsible for radiation protection program and their training and experience.

The Radiation Safety Officer for this license and the Chief of the Health Physics Office at Walter Reed Army Medical Center (WRAMC) is LTC Peter H. Myers. LTC Myers previous training and experience is listed in enclosure 1. LTC Myers was present when the initial operators training was presented for the [ ] irradiator by the vendor's representative. He will also be attending an in-house course given by the principle user of the AECL irradiators at Walter Reed Army Institute of Research (WRAIR) to all new users.

Item #8 Training for individuals working in or frequenting restricted areas.

Chapter 2 of WRAMC Regulation 40-10 (see enclosure 2) covers the Health Physics training provided at Walter Reed. In the case of the irradiators the initial and annual briefings provided by the principle users will include a review of the SOP's and emergency procedures applicable to their irradiator as well as a hands-on exercise of the irradiator operation. Enclosure 3 is a copy of a sample class schedule for a typical Introductory Principles of Radiation Protection (IPRP) class.

Item #9 All five irradiators are located in rooms which are controlled access areas which remain locked when not occupied by approved personnel. In addition all the irradiators are themselves key locked with the keys being controlled by the principle users.

The [ ] irradiator is located on the [ ] floor of building 2 (the main hospital) Walter Reed AMC in room [ ]. The room is bordered on one side by a corridor with no direct access to the room, on two sides by controlled access storage rooms [ ] and on the fourth side by an infrequently used controlled access hallway. The storage rooms will have intermittent occupancy by no more than two (2) employees per room. The overhead area is a controlled access interstitial space for piping and ventilation systems and would be occupied only in case of repairs. A diagram of room [ ] and surrounding areas is attached (enclosure 4). Room [ ] is equipped with an automatically operated fire detection and control system (sprinkler) that is adequate to ensure the integrity of the irradiator and source in a fire.

The AECL irradiators are located in ground floor rooms with concrete floors, lead lined concrete or cinder block walls, and

concrete overheads. These locations are in fire-resistant buildings with little combustible material which ensures a very low level of radiation risk attributable to fires. In addition both Ft. Detrick and WRAMC have their own on post fire departments who have been instructed on the locations and possible hazards of the irradiators. Irradiators A & B Item #5 are located in building 40 (WRAIR), room B101 (see enclosure 5) and irradiators C & D Item #5 are located in building 1425, room AR109, USAMRIID, Ft. Detrick (see enclosure 6).

Item #10.1 All personnel using the irradiators will employ some form of personnel monitoring. Most routine users have permanently assigned TLD's from the Army Dosimetry Center, which are changed at least quarterly. All other users will employ direct-reading pocket dosimeters with a 0-200mr/hr range. These dosimeters will be logged out on a daily basis with the initial and final readings recorded in a record maintained by the principle users. Any off-scale reading will be immediately reported to the Health Physics Office and an evaluation will be conducted to determine the individuals dose.

Item #10.2 Survey meters that can measure up to several hundred milliroentgens per hour are available for monitoring. These instruments will (1) be calibrated so that the readings are within  $\pm 20\%$  of the actual values over the range of the instrument and (2) be calibrated at least annually and after servicing (other than a simple battery exchange). Survey instruments will be calibrated by an annually contracted company, whose procedures and sources are approved by the NRC or an Agreement State. Calibration records will be kept by the HPO for a minimum of two years. Our contractor for the past couple of years has been Health Physics Services, Incorporated, 1350 Piccard Drive, Rockville, Maryland 20850, NRC license # 19-19791-01. We also have recently sent some instruments for repair and calibration to the Department of the Army, U.S. Army Test, Measurement and Diagnostic Equipment Support Center Aberdeen, Aberdeen Proving Ground, Maryland 21005-5001, Commodities license # 29-01022-14.

Item #10.3 Walter Reed Army Medical Center holds an NRC specific license of broad scope issued pursuant to 10 CFR Part 33. LTC Myers is the RSO on that license and the Chief of the Health Physics Office. The leak tests will be performed as required at 6 month intervals by the HPO and counted on an instrument capable of quantitatively measuring 0.005  $\mu\text{Ci}$  of activity.

Item #10.4 Written operating and emergency procedures are provided to each person who uses the irradiator. Copies are also maintained in the irradiator rooms with the emergency procedures and emergency phone numbers conspicuously posted. These procedures include; step-by-step procedures for operation of the irradiator, instructions on use of personnel dosimetry and recording doses,

criteria to ensure that only authorized persons will use the irradiator, inspections or pre-run test procedures to ensure the irradiator and safety devices (interlocks etc.) are functioning properly, prohibited modifications (for example, over-riding an interlock or removing shielding), and emergency procedures and phone numbers in case of abnormal radiation levels around the irradiator. The requirement to limit access to any area with a radiation level greater than 2 mr/hr will be included.

Item #10.5 Installation, replacement, reloading, or any repairs or alterations which might involve removal of shielding or access to the licensed material will be performed by the supplier or other persons who are specifically licensed by the NRC or an Agreement State for such work.

Item #11 The disposal of the licensed material in the irradiators will be accomplished by transferring the irradiators to the supplier or to a licensee specifically authorized to accept it.



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

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

(see attachment 7 for course curriculum)

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 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,

*has successfully completed the*  
SENIOR OFFICERS NUCLEAR ACCIDENT COURSE (G302P0313-1)  
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

EX 2





DEPARTMENT OF THE ARMY  
MEDICAL COLLEGE 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-8	CPT(P) Connock
1100-1150	Nuc Med Sci Officers in the Field LUNCH	
1300-1330	AFFRI Orientation	COL Adcock/MAJ Hagan
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 LUNCH	LTC Field
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 LUNCH	John Villforth
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 LUNCH	MAJ Day
1315-1630	Out-Processing Sign-Out	SM SDO & SDNCO

# THE UNITED STATES AIR FORCE



PLATE 1111 I. 1. 1. 1.

*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



1-3 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

A handwritten signature in black ink, appearing to read "Bobby R. Adcock".

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 credit hours in Category I of the Physician's Recognition Award of the American Medical Association.

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DEPARTMENT OF THE ARMY  
**COMMUNICATE 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	ROOM
Monday, May 30	8:00 AM	Welcome, Registration, Orientation	Beck/Kent	E-4
	9:00 AM	ATOMIC AND NUCLEAR STRUCTURE	PAULSON	E-4
	11:00 AM	Math Review	Beck	E-4
	1:00 PM	INTRODUCTION TO RADIOACTIVITY	PAULSON	E-4
	2:30	COMPUTER ORIENTATION	GLEASON	W-14
Tuesday, May 31	8:00 AM	MODES AND RATES OF DECAY	PAULSON	E-4
	9:30 AM	Lab: Computational Techniques	Beck	E-4
	10:30 AM	COUNTING STATISTICS	GLEASON	E-4
	1:00 PM	PARTICLE INTERACTIONS	PAULSON	E-4
	2:30 PM	GAS DETECTORS: G-M COUNTERS	BECK	E-4
	3:30 PM	Lab: HP-1 Laboratory Techniques	Kent/Auxier	W-15
Wednesday, June 1	8:00 AM	GAMMA INTERACTIONS	PAULSON	E-4
	9:30 AM	Lab: HP-2 G-M Counting	Auxier/Beck	W-15
	1:00 PM	GAS DETECTORS: PROPORTIONAL COUNTERS	KENT	E-4
	2:30 PM	Lab: HP-3 Beta Characteristics	Auxier/Paulson	W-15
Thursday, June 2	8:00 AM	QUANTITIES AND UNITS I	BECK	E-4
	9:30 AM	Review & Problem Session	Kent	E-4
	10:30 AM	GAS DETECTORS: IONIZATION CHAMBERS	KENT	E-4
	1:00 PM	SCINTILLATION SPECTROMETRY I	GLEASON	E-4
	2:30 PM	Lab: HP-8 Proportional Counting	Beck/Kent	W-15
Friday, June 3	8:00 AM	QUANTITIES AND UNITS II	BECK	E-4
	9:30 AM	Review and Quiz	Beck/Kent	E-4
	10:30 AM	SCINTILLATION SPECTROMETRY II	GLEASON	E-4
	1:00 PM	BIOLOGY REVIEW	GIST	E-4
	2:30 PM	Lab: HP-5 Gamma Ray Spectrometry	Gleason	W-15

## APPLIED HEALTH PHYSICS

June 5 - 10, 1977

SECOND WEEK

DATE	TIME	TOPIC	LECTURER	ROOM
Monday, June 6	8:00 AM	SCINTILLATION SPECTROMETRY III	GLEASON	E-4
	9:30 AM	Lab: HP-6 Multichannel Analyzer	Paulson/Gleason	W-1
	1:00 PM	RADIATION BIOLOGY I	CLOUTIER	E-4
	2:30 PM	Lab: HP-45 Bio. Effects of Radiation <sup>6, 7</sup>	Gist/Auxier	E-9
Tuesday, June 7	8:00 AM	LIQUID SCINTILLATION COUNTERS	GIST	E-4
	9:30 AM	Lab: HP-20 Liquid Scintillation Counters	Gist/Kent	W-1
	1:00 PM	RADIATION BIOLOGY II	CLOUTIER	E-4
	2:30 PM	RADIATION PROTECTION GUIDES I	BECK	E-4
Wednesday, June 8	8:00 AM	X-RAY PRODUCTION AND CHARACTERISTICS	CLOUTIER	E-4
	9:30 AM	Review and Problem Session	Kent	E-4
	10:30 AM	SHIELDING I	BECK	E-4
	1:00 PM	SHIELDING II	KENT	E-4
	2:30 PM	Lab: HP-18 Shielding	Kent/Beck	W-1
Thursday, June 9	8:00 AM	RADIATION PROTECTION GUIDES II	BECK	E-4
	9:30 AM	ACUTE EFFECTS OF RADIATION	ANDREWS	E-4
	10:45 AM	Shielding Evaluation Problem	Kent	E-4
	1:00 PM	IONIZATION SURVEY INSTRUMENTS	KENT	E-4
	2:30 PM	Lab: HP-13 Ionization Survey Meter Characteristics	Beck/Kent	E-4
Friday, June 10	8:00 AM	GEIGER-MUELLER SURVEY INSTRUMENTS	BECK	E-4
	9:00 AM	Lab: HP-21 Condenser R Meter	Beck/Kent	MED
	11:00 AM	Review and Quiz	Beck/Kent	E-4
	1:00 PM	SOURCES OF HEALTH PHYSICS INFORMATION	BECK	E-4
	2:00 PM	Lab: HP-14 G-M Survey Instruments	Beck/Kent	E-4

## 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) $\gamma$ Scintillation Instruments	Beck	E-4
		(B) $\alpha$ Instruments	Kent	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) $\gamma$ Scintillation Instruments	Beck	E-4
(A) $\alpha$ Instruments		Kent	E-4	
Tuesday, June 14	8:00 AM	STANDARDIZATION	GLEASON	E-4
	9:30 AM	Lab: HP-35 Standardization	Gleason	W-14
		1:00 PM	NEUTRON SURVEY INSTRUMENTS	
	2:30 PM	Lab: (A) HP-15 $\text{BF}_3$ Detectors	Beck	W-15
(B) HP-16 Neutron Survey Instruments		Kent	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 $\text{BF}_3$ Detectors	Beck	W-15
(A) HP-16 Neutron Survey Instruments		Kent	E.B.	
Thursday, June 16	8:00 AM	THERMOLUMINESCENT DOSIMETRY	BECK	E-4
	9:30 AM	Lab: (A) HP-25 Thermoluminescent Dosimetry	Beck	W-1
		(B) HP-22 Film Dosimetry	Kent	W-1
	1:00 PM	INTERNAL DOSIMETRY I	CLOUTIER	E-4
	2:30 PM	Lab: (B) HP-25 Thermoluminescent Dosimetry	Beck	W-1
(A) HP-22 Film Dosimetry		Kent	W-1	
Friday, June 17	8:00 AM	INTERNAL DOSIMETRY II	CLOUTIER	E-4
	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, f	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-15
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-14
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-14 W-14
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.B
	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-4 W-1

APPLIED HEALTH PHYSICS

June 27 - July 1, 1977

FIFTH WEEK

DATE	TIME	TOPIC	LECTURER	ROOM
Monday, June 27	8:00 AM	WATER SAMPLING AND ANALYSIS		E-4
	9:30 AM	Lab: (B) Decontamination	Beck/Kent	W-19
	1:00 PM	CONTAMINATION & SMEAR SURVEYS	BERGER	E-4
	2:30 PM	Lab: (A) HP-33 Decontamination (B) HP-37 Water Analysis	Beck/Kent Kent/Beck	W-19 W-19
Tuesday, June 28	8:00 AM	LOW LEVEL COUNTING	GLEASON	E-4
	9:30 AM	Lab: HP-12 Low Level Counting	Gleason/Paulson	W-19
	1:00 PM	CRITICALITY SAFETY		E-4
	2:30 PM	Lab: Practice Survey	Beck/Kent	E-4
Wednesday, June 29	8:00 AM	WASTE DISPOSAL	BERGER	E-4
	9:30 AM	Review and Problem Session	Kent	E-4
	11:00 AM	X-RAY FLUORESCENCE	PAULSON	E-4
	1:00 PM	TRANSPORTATION		E-4
	2:30 PM	Lab: (A) HP-47 X-Ray Fluorescence	Paulson/Gleason	E.B
Thursday, June 30	8:00 AM	SEALED SOURCE DESIGN AND TESTING	BERGER	E-4
	9:30 AM	LICENSING REGULATIONS	BECK/BERGER Cloutier/Kent	E-4
	1:00 PM	PUBLIC INFORMATION	ALEXANDER	E-4
	2:00 PM	Field Exercise	Beck/Kent	E-4
Friday, July 1	8:00 AM	Critique	Beck/Kent	E-4
	9:00 AM	Final Exam	Beck/Kent	E-4
	10:00 AM	HEALTH PHYSICS CHALLENGES	CLOUTIER	E-4
	11:00 AM	Commencement	Beck/Kent	E-4
	12:00 N	END OF COURSE		

# 1990 HEALTH PHYSICS CERTIFICATION EXAMINATION PREPARATION COURSE

## Preliminary Schedule

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

CHAPTER 2  
Training

2-1. GENERAL. The NRC requires that training be given to any employee who works in or frequents the vicinity of any area controlled by the licensee for protection of individuals from exposure to ionizing radiation. The Commander, WRAMC, has implemented training programs pertaining to the hazards of radiation and the methods for minimizing those hazards for radiation workers and other personnel.

## 2-2. PROGRAMS.

## a. Initial Briefing.

(1) The Principal User is responsible for individuals who work under or are associated with work areas designated on his Authorization for the Use of Radioisotopes. He is required to give and document an initial and annual briefing to those individuals which covers, at a minimum, the following:

(a) WRAMC Notice to Employees

(b) Form NRC-3, Notice to Employees

~~(c) Title 10, Code of Federal Regulations, Parts 19, 20 and 21~~

(d) Information concerning the storage, transfer and use of radioisotopes allowed under his authorization

(e) Authorization to Use Radioisotopes (WRAMC Form 1661-R, Application for Authorization to Use Radioactive Material - Human Use and/or WRAMC Form 1662-R, Application for Authorization to Use Radioactive Material - Non-human Use)

(f) Hazards and protective measures associated with isotope usage

(g) Procedures for requesting a report of exposure to radiation

(2) This briefing will be given and acknowledged by signing WRAMC Form 538, Radiation Worker Briefing.

b. Introductory Principles of Radiation Protection Course: This two-day course, given by the staff of the HPO, is designed to complete and reinforce training given by the Principal User. It provides supplementary training, in an academic setting, required for the safe handling of

radioisotopes and protection of individuals from external and internal radiation hazards. It is required that all radiation workers attend this course, as soon as possible, after beginning work at WRAMC. An examination is given at the end of this course. If the student fails the exam it may be retaken, after additional preparation, or the student may elect to retake the course. Subsequent failure requires that the Principal User evaluate the advisability of retaining the individual in a position which requires the handling and use of radioisotopes.

c. Principal User Classes. The senior staff of the HPO conducts periodic classes on selected topics. These topics are based on the need to disseminate current information on license and regulation changes, to correct deficiencies which have been noted and to enhance the professional competency of individuals working in radiation environments. This is mandatory for Principal Users. Co-workers are encouraged to attend.

d. Nursing In-service: Briefings, designed for nursing and para-professional staff who come in contact with patients undergoing therapy with radioisotopes, are presented upon request to the HPO. Specific details on the types of therapy or other procedures are covered.

e. Briefing for Support Personnel: This class is designed for individuals whose duties take them into areas where radioisotopes are used. It familiarizes personnel with signs, placards and color schemes associated with ~~radioactive material, gives a general outline of what radiation and contamination are and sets ground rules for what should and should not be done in these areas.~~

f. Briefing for Firefighters: This briefing covers methods of designating areas where radioactive materials are used, use of radiation detection instrumentation, notification procedures and procedures for ensuring protection from contamination and internal deposition.

g. Briefing for Military Police/Security Personnel: This class teaches the proper method for receiving, inspecting and storing incoming packages containing radioisotopes and addresses the procedures for dealing with problems such as a damaged container or leaking package.

## Introductory Principles of Radiation Protection

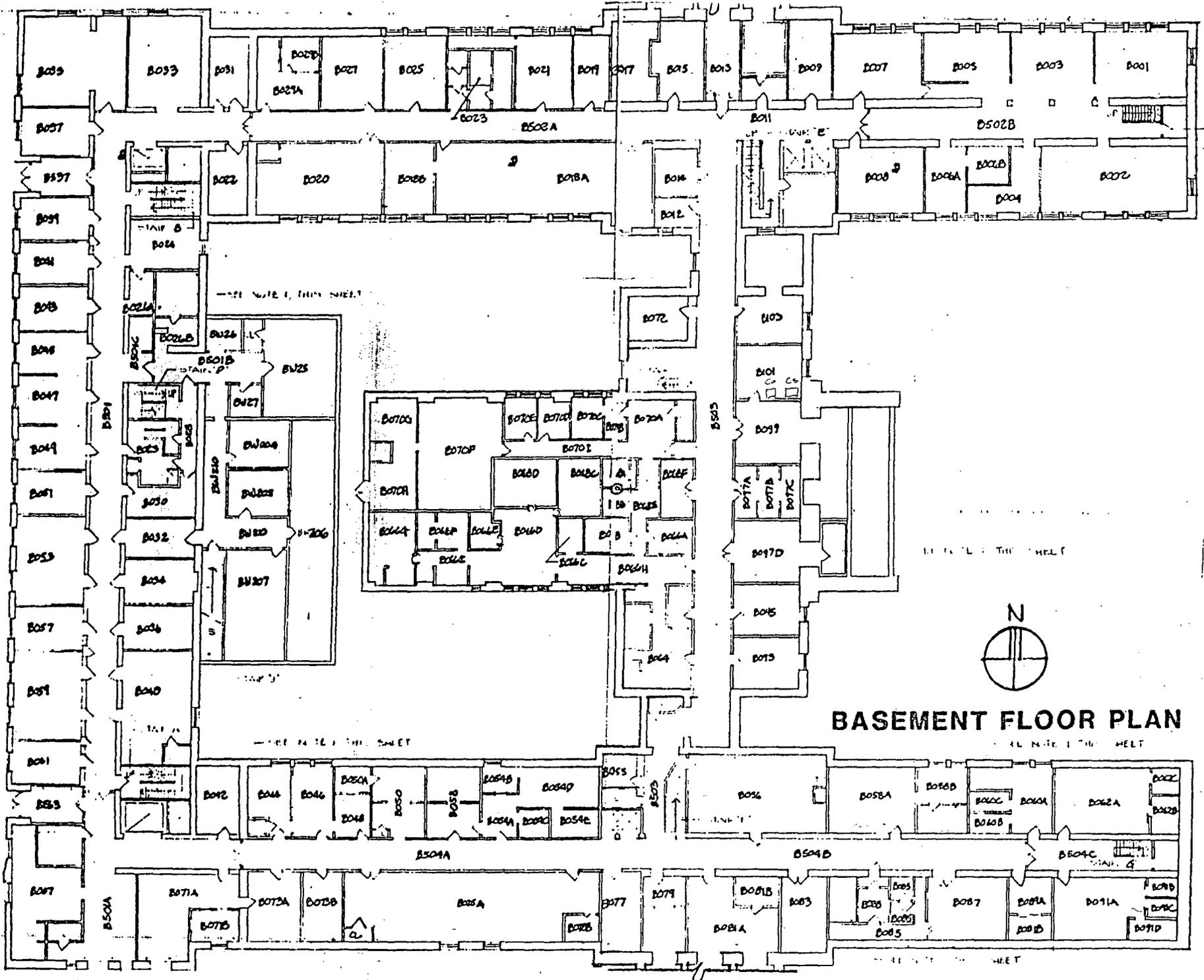
Presented By: Health Physics Office, WRAMC  
For: All users of Radioactive Materials  
Length: Two Days (Technicians); One Day (Principle Users)  
Location: Building 2, Room 2H02  
Dates: 7 and 8 May 1991  
Coordinator: SFC Green, NCOIC, Health Physics Office

<u>Time</u>	<u>Topic</u>	<u>Instructor</u>
0800-0815	Course Registration	SFC Green
0815-0845	Course Introduction	LTC Myers
0845-0900	Break	
0900-0945	Characteristics of Ionizing Radiation	LTC Myers
0945-1000	Break	
1000-1045	Radiation Decay and Units	MAJ Samiljan
1045-1100	Break	
1100-1145	Biological Effects of External Ionizing Radiation Exposures	LTC Myers
1145-1300	Lunch	
1300-1345	Internal Contamination	LTC Myers
1345-1400	Break	
1400-1445	Principles of Radiation Detection; Survey Instrument Selection and Operation	SFC Green
1345-1400	Break	
1500-1545		

Introductory Principles of Radiation Protection  
(second day)

<u>Time</u>	<u>Topic</u>	<u>Instructor</u>
0800-0815	Course Registration for PUs	SFC Green
0815-0845	Course Introduction for PUs	LTC Myers
0845-0900	Break	
0900-0945	Personnel Dosimetry and Bioassay	2LT Cummings
0945-1000	Break	
1000-1045	Radioisotope Lab Set-up; Survey Procedures/Requirements	SSG Lewis
1045-1100	Break	
1100-1145	Incident/Spill Procedures	SFC Green
1145-1300	Lunch	
1300-1345	Radioactive Material Control	Mr. Burton
1345-1400	Break	
1400-1445	Test	SFC Green

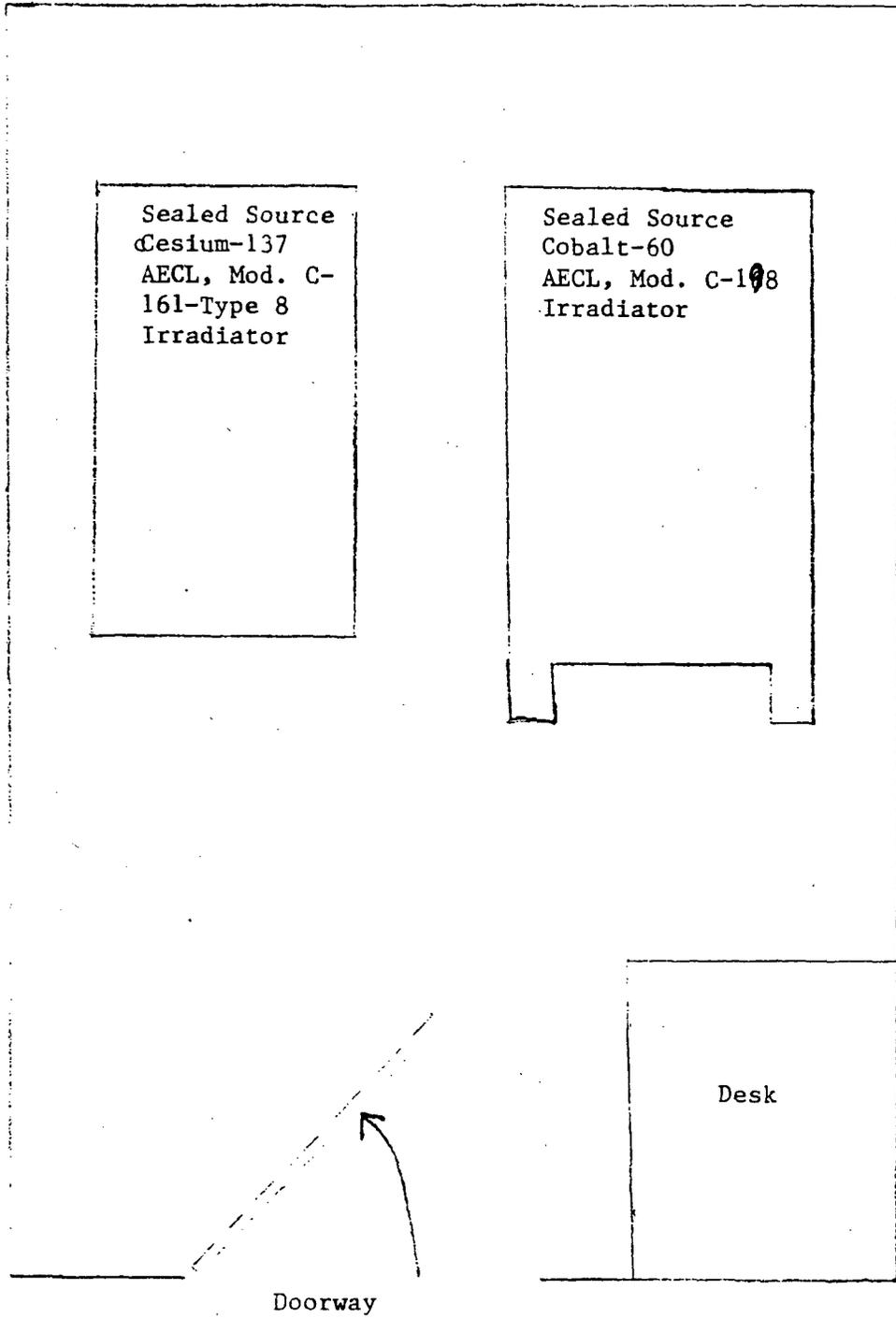
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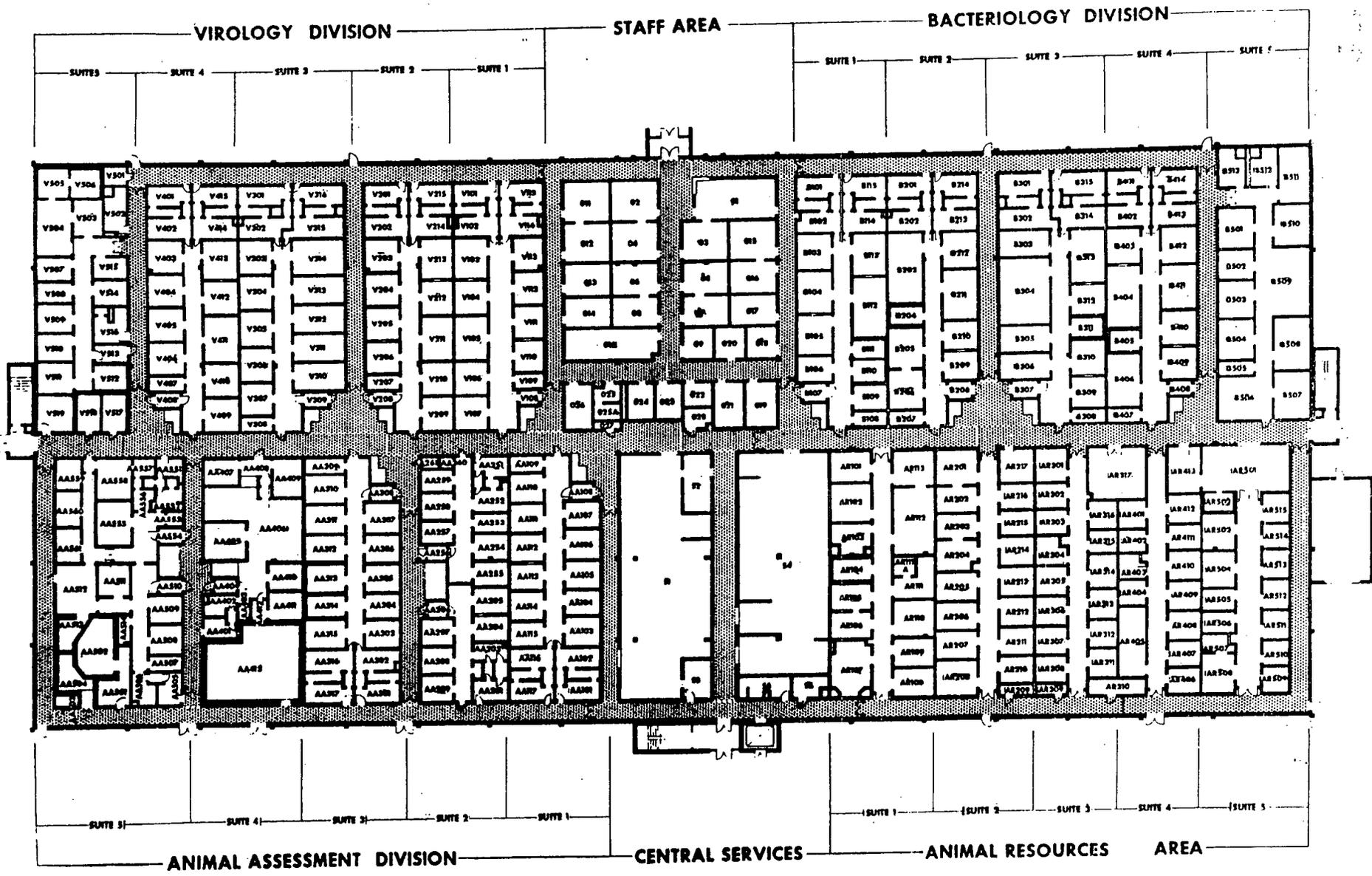


**BASEMENT FLOOR PLAN**

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AR Room 109 Bldg. 1425





FLOOR PHASE I PLAN

MATERIALS LICENSE

Amendment No. 21

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
- 2. Washington, D. C. 20307-5001

In accordance with letter dated July 11, 1991,  
3. License number 08-01738-03 is amended in its entirety to read as follows:

- 4. Expiration date November 30, 1996
- 5. Docket or Reference No. 030-06895

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. Cobalt 60
- B. Cesium 137
- C. Cesium 137

- A. Sealed sources (AECL Models C-166, C-167 or C-198)
- B. Sealed sources (AECL Model C-161 Type 8)
- C. Sealed sources

- A. 3,500 curies per source and 70,000 curies total
- B. 2,100 curies per source and 8,400 curies total
- C.

9. Authorized use

- A. To be used in AECL Gammacell 220 irradiator for medical research and development and radiation dosimetry.
- B. To be used in AECL Gammacell 40 Irradiator for small animal irradiation, medical research, development and radiation dosimetry.
- C. To be used in a [ ] Irradiator to irradiate blood products.

CONDITIONS

- 10. License material shall be used at WRAMC, Washington, D.C.
- 11. A. Licensed material shall be used by individuals who have satisfactorily completed the training program outlined in the application dated March 18, 1991 and have been designated by the individual approved by the Radiation Control Committee. Records of training shall be maintained by the licensee.
- B. The Radiation Safety Officer for this license is Major Arthur G. Samiljan.

Information in this record was deleted in accordance with the Freedom of Information Act, exemptions 2 + b  
FOIA 2006-0238

OFFICIAL RECORD COPY ML 10

Handwritten initials and numbers: JJ/6, Ex 2

**MATERIALS LICENSE  
SUPPLEMENTARY SHEET**

License number

08-01738-03

Docket or Reference number

030-06895

Amendment No. 21

(Continued)

**CONDITIONS**

12. Sealed sources containing licensed material shall not be opened.
- 13.A. Sealed sources and detector cells shall be tested for leakage and/or contamination at intervals not to exceed 6 months or at such other intervals as are specified by the certificate of registration referred to in 10 CFR 32.210, not to exceed 3 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 3 months.
- C. In the absence of a certificate from a transferor indicating that a 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.
- E. Sealed sources and detector cells need not be leak tested if:
- (i) they contain only hydrogen 3; or
  - (ii) they contain only a 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. Records of leak test results shall be kept in units of microcuries and shall be maintained for inspection by the Commission. 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 shall be removed from service and decontaminated, repaired, or disposed of in accordance with Commission regulations. The report shall be filed within 5 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 involved, the test results, and corrective action taken.

MATERIALS LICENSE  
SUPPLEMENTARY SHEET

License number

08-01738-03

Docket or Reference number

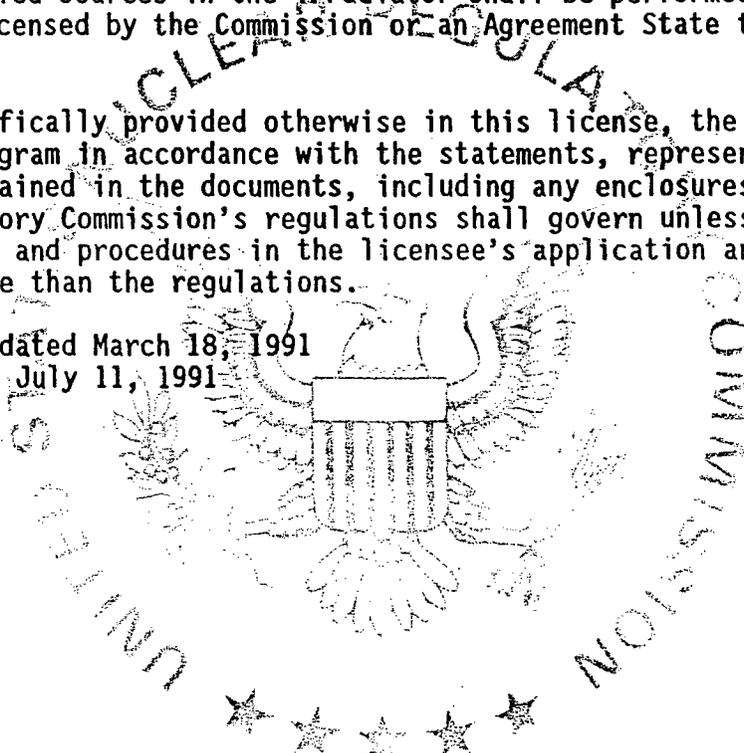
030-06895

Amendment No. 21

(13. Continued)

CONDITIONS

- G. The licensee is authorized to collect leak test samples for analysis by individuals approved by the Radiation Control Committee. 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.
- 14. 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 a person specifically licensed by the Commission or an Agreement State to perform such services.
- 15. 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 March 18, 1991
  - B. Letter dated July 11, 1991



For the U.S. Nuclear Regulatory Commission

Original Signed By:  
Judith A. Joustra

By

Nuclear Materials Safety Branch  
Region I  
King of Prussia, Pennsylvania 19406

Date

SEP 17 1992

SEP 17 1992

License No. 08-01738-03  
Docket No. 030-06895  
Control No. 115017

Department of the Army  
Office of the Surgeon General  
ATTN: Peter H. Myers  
Lieutenant Colonel  
HQDA (DASG-PSP)  
5109 Leesburg Pike  
Falls Church, Virginia 22041-3258

Dear Colonel Myers:

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."

With the issuance of License No. 19-11831-01, to USAMRIID, those sources previously listed under your license and belonging to USAMRIID, have been deleted.

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

Department of the Army

-2-

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

Francis M. Costello, Chief  
Industrial Applications Section  
Division of Radiation Safety  
and Safeguards

Enclosures:

1. Amendment No. 21
2. Requirements for Materials License

DRSS:RIK  
Kirkwood/gc

09/15/92

DRSS:RI  
J. Costello

09/14/92

# CONVERSATION RECORD

TIME

DATE

TYPE

 VISIT CONFERENCE TELEPHONE INCOMING OUTGOING

ROUTING

NAME/SYMBOL

INT

Location of Visit/Conference:

NAME OF PERSON(S) CONTACTED OR IN CONTACT WITH YOU

Dave BURTON

ORGANIZATION (Office, dept., bureau, etc.)

WRAMC

TELEPHONE NO.

(301) 427-5104

SUBJECT

Correct WRAMC license source limits to allow for source changes / Delete USAMRIID sources

SUMMARY

1. As per attached letter of 7/30/91, USAMRIID has licensed its irradiators itself. Mr. Burton agreed to delete USAMRIID sources along with amendment to change RSO and increase source limits.

ACTION REQUIRED

NAME OF PERSON DOCUMENTING CONVERSATION

A. Kirkwood

SIGNATURE

A. Kirkwood

DATE

8/19/92

ACTION TAKEN

**"OFFICIAL RECORD COPY" ML 10**

SIGNATURE

TITLE

DATE



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

03520

REPLY TO  
ATTENTION OF

July 30, 1991

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 an application for a new  
Byproduct Material License (gammacell, sealed-source  
irradiators) from the U.S. Army Medical Research Institute of  
Infectious Diseases (USAMRIID), Fort Detrick, Maryland,  
21701-5011.

This organization has historically been covered under a  
license issued to the Walter Reed Army Medical Center. Efforts  
have been underway since last year to develop an application for  
a separate license. The growth of USAMRIID and our desire to  
align license accountability under appropriate Army command  
channels, where feasible, have prompted this application.

Recommend approval.

Sincerely,

Peter H. Myers  
Lieutenant Colonel, U.S. Army  
Radiological Hygiene Consultant

Enclosure

115186

"SECTION COPY"

AUG 02 1991

030-06895



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



REPLY TO  
ATTENTION OF:

HSHL-HP (385-11m)

11 JUL 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. 08-01738-03.

1. Request that NRC License No. 08-01738-03 for Walter Reed Army Medical Center be amended to reflect a change in the Radiation Safety Officer from LTC Peter H. Myers to MAJ Arthur G. Samiljan. MAJ Samiljan has been assigned as the Chief, Health Physics Office at Walter Reed AMC since June 1991, before that he was the Chief, Operations Branch of the Health Physics Office and alternate RPO at WRAMC since August 1990. A Training and Experience Form and a Curriculum Vitae for MAJ Samiljan are enclosed (Enclosures 1 and 2).

2. Please be advised that Col Joan T. Zajtchuk is the new Deputy Commander for Clinical Services and in that capacity is the new Chairman of the Radiation Control Committee of Walter Reed Army Medical Center.

FOR THE COMMANDER:

  
ROY D. QUICK, JR.  
MAJ, MS  
Executive Officer

2 Encls

Copies Furnished

Commander, US Army Health Services Command, ATTN: HSCL-P, Fort  
Sam Houston, TX 78234-6000  
HQDA (SGPS-PSP-E), 5109 Leesburg Pike, Falls Church, VA 22041-  
3258

FREE FREIGHT

115017

JUL 17 1991

OFFICIAL RECORD COPY

**TRAINING AND EXPERIENCE  
OF AUTHORIZED RADIOISOTOPE USERS**

1. NAME OF AUTHORIZED USER (Last, First, MI)  <b>SAMILJAN, ARTHUR G.</b>	2. STATE OR TERRITORY IN WHICH LICENSED:  <i>(MD, DDS, DVM, etc.)</i>
--	---

RANK GRADE	ORGANIZATION	ORGANIZATIONAL DIVISION	BLDG./ROOM NO.	WRAMC AUTHORIZATION NO.
MAJ	WRAMC	Health Physics	Bldg 188 FGS	221

**3. CERTIFICATION**

SPECIALTY BOARD A	CATEGORY B	MONTH AND YEAR CERTIFIED C

**4. FORMAL EDUCATION                      HIGHEST ACADEMIC DEGREE ATTAINED**

Higher Educational Institutions Attended	Type of Program Pursued and Dates of Attendance	Degree, Diploma or Certificate Received and Date
a. <u>University of FL</u>	<u>MS Env Eng (Rad Hlth)</u>	<u>MS [ ]</u>
b. _____	_____	_____
c. _____	_____	_____
d. _____	_____	_____

**5. TRAINING RECEIVED IN BASIS RADIOISOTOPE HANDLING TECHNIQUES**

FIELD OF TRAINING A	LOCATION AND DATE(S) OF TRAINING <i>(Include course title if known)</i> B	TYPE AND LENGTH OF TRAINING	
		LECTURE LABORATORY COURSES <i>(Hours)</i> C	SUPERVISED LABORATORY EXPERIENCE <i>(Hours)</i> D
a. RADIATION PHYSICS AND INSTRUMENTATION	University of Florida Kirtland AFB, AFRRRI	60	20
b. RADIATION PROTECTION	"	60	20
c. MATHEMATICS PERTAINING TO THE USE AND MEASUREMENT OF RADIOACTIVITY	"	100	20
d. RADIATION BIOLOGY	"	60	20
e. RADIOPHARMACEUTICAL CHEMISTRY			

*Ex 6*

*E 1 1*

CIRRICULUM VITAE

for

ARTHUR G. SAMILJAN, Major

DATE AND PLACE OF BIRTH: I I

YEARS OF ACTIVE MILITARY SERVICE: Over 18 years

PRESENT ASSIGNMENT: (21 Jun 91 to present)  
Chief, Health Physics Office; Alternate RPO,  
Walter Reed Army Medical Center,  
Washington, DC 20307-5001

MILITARY EDUCATION (pertinent to radiation protection):

1. Medical Effects of Nuclear Weapons Course, 8-12 Sep 86  
Armed Forces Radiobiology Research Institute  
Bethesda, Maryland
2. Army Medical Department Physics and Military Medicine Course,  
26-30 Oct 87  
U.S. Army Environmental Hygiene Agency  
Aberdeen Proving Ground, Maryland  
  
(included presentations on management of radiation protection  
programs and topical radiation protection issues)
3. Radiological Hazards Associated with Depleted Uranium  
Munitions Course, 16-20 Nov 87  
U.S. Army, Belvoir Research, Development & Engineering  
Center, Fort Belvoir, Virginia
4. Laser Microwave Hazards Workshop, 25-29 Apr 88  
U.S. Army Environmental Hygiene Agency  
Aberdeen Proving Ground, Maryland
5. The Army Medical Department Radiation Health Sciences Course,  
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)
6. Senior Officer Nuclear Accident Course, 24-27 Apr 89  
InterService Nuclear Weapons School  
Kirtland Air Force Base, New Mexico

Ex 6

MILITARY EDUCATION (continued):

7. Management of Radiation Accidents and Emergency Preparedness Training Course, 5-9 Jun 89  
U.S. Army, Belvoir Research, Development & Engineering Center, Fort Belvoir, Virginia
8. Nuclear Weapons Incident Seminar, 7-8 Mar 91  
Naval Base  
Norfolk, Virginia
9. Medical X-Ray Survey Techniques Course, 15-26 Apr 91  
Academy of Health Sciences  
Fort Sam Houston, Texas

CIVILIAN EDUCATION (relative to radiation protection):

Graduate Study leading to Master of Science Degree in Environmental Engineering (emphasis in Health Physics)  
Aug 84 - Dec 85  
University of Florida  
Gainesville, Florida

HEALTH PHYSICS EXPERIENCE:

1. Nuclear, Biological, and Chemical Officer  
Mar 76 - Jun 77  
44th Medical Brigade  
Fort Bragg, North Carolina  
  
(included designing and supervising the training of 100 personnel in battle field radiation detection, survey techniques, monitoring, decontamination, and protection)
2. Nuclear, Biological, and Chemical Officer  
Jun 77 - Dec 78  
5th General Hospital  
Bad Cannstatt, Germany  
  
(included designing and supervising the training of 350 personnel in battle field radiation detection, survey techniques, monitoring, decontamination, and protection)
3. Manager, Department of the Army, Nuclear Test Personnel Review  
Jan 86 - Dec 87  
Environmental Support Group  
Washington, DC  
  
(included the identification, dose assessments, and notification of all Army personnel who participated in the atmospheric nuclear testing program from 1944 to 1963.

4. Medical Health Physics Consultant  
Dec 87 - Jun 89  
Headquarters, Army Materiel Command  
Office of the Command Surgeon  
Alexandria, Virginia

(included being the Commanding General's action officer for health aspects of ionizing and nonionizing radiation as applied to the command's workforce, and technical advisor on health hazard assessment of new materiel and to related materiel management processes.)

5. Contract Manager, Johnston Island Plutonium Clean-up Project  
Jun 89 - Aug 90  
Field Command  
Defense Nuclear Agency  
Johnston Atoll

(included planning, directing, and supervising the clean-up project, conducting radiological site surveys, and establishing procedures for packaging, storing, and disposal of radioactive waste)

6. Chief, Operations Branch/Assistant RPO  
Aug 90 - Jun 91  
Health Physics Office  
Walter Reed Army Medical Center  
Washington, DC

(included reviewing x-ray compliance surveys and radiisotope laboratory room surveys, monitoring radiation therapy procedures, performing x-ray shielding evaluations and dose assessments, and assisting the RPO in the preparation and execution of all radiation protection policies in support of the medical center's NRC license, and ionizing and nonionizing radiation producing devices)

Armed Forces Radiobiology Research Institute

Defense Nuclear Agency

# Certificate of Completion

This is to certify that

MAJ Arthur G. Samrl Jan  
F [redacted] Ex 6

has completed 29 hours of

**MEDICAL EFFECTS OF  
NUCLEAR WEAPONS**

conducted by the  
Armed Forces Radiobiology Research Institute,  
Bethesda, Maryland.



8-12 September 1986

DATE

*James J. Conklin*

JAMES J. CONKLIN  
Colonel, USAF, MC  
Director

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
Military Radiobiology: A Perspective . . . . .	B
Physical Principles of Nuclear Weapons . . . . .	C
Blast and Thermal Effects of Nuclear Weapons . . . . .	D
Physical Principles of Ionizing Radiation Effects . . . . .	E
Cellular Radiation Biology . . . . .	F
Effects of Ionizing Radiation on Organ Function . . . . .	G
Performance Decrement Caused by Ionizing Radiation . . . . .	H
The Acute Radiation Syndrome: Diagnosis and Treatment . . . . .	I
Current Concepts in Management of Radiation Injuries and Associated Trauma	J
Medical Operations in Nuclear War . . . . .	K
Impact of Electromagnetic Radiation . . . . .	L
Human Experience in Radiation Injury . . . . .	M
Nuclear Weapons Accidents . . . . .	N
Radiation-Detecting Devices . . . . .	O
Fallout: Its Characteristics and Management . . . . .	P
Thermal Trauma in Nuclear Warfare . . . . .	Q
Long-Term Effects of Ionizing Radiation . . . . .	R
Radiation Sources: Principles and Operations . . . . .	S
Radiation Pathology . . . . .	T
Detection and Decontamination of Radiation Casualties . . . . .	U
Radioprotectants . . . . .	V
Internal Contamination With Medically Significant Radionuclides . . . . .	W
Psychological Effects of Nuclear Weapons . . . . .	X



DEPARTMENT OF THE ARMY  
**CERTIFICATE OF TRAINING**

This is to certify that

MAJ ARTHUR G. SAMILJAN

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

# This is to Certify that

MAJ ARTHUR G. SAMILJAN

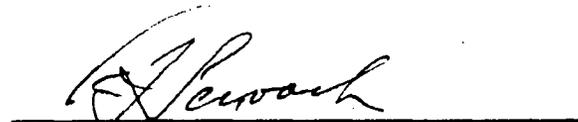
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has attended the "Radiological Hazards Associated with Depleted Uranium Munitions" training course presented by the United States Army, Belvoir Research, Development and Engineering Center, at Fort Belvoir, Virginia, November 16-20, 1987.



---

**L. H. Munson**  
Pacific Northwest Laboratory



---

**F. J. Lenoach, Chief**  
Training and Development Division  
Civilian Personnel Office



---

**D. E. Hadlock**  
Pacific Northwest Laboratory

RADIOLOGICAL HAZARDS ASSOCIATED  
WITH DEPLETED URANIUM MUNITIONS

COURSE OUTLINE

<u>Topics</u>	<u>Reference Text</u>
- <u>Purpose of Radiation Safety Program</u>	Chapter 3, pages 3-26
Controls	
Regulations	Chapter 6, pages 3-26
Implementation	Chapter 8, pages 15-34
Inspection and Enforcement	
Radiation Safety Program and Depleted Uranium	
- <u>History of Depleted Uranium Production</u>	
- <u>Military Uses of Depleted Uranium</u>	
Uses of Depleted Uranium	
Advantages of Depleted Uranium	
Disadvantages of Depleted Uranium	
- <u>Characteristics of Depleted Uranium</u>	
Isotopic	
Physical Properties	
Chemical Properties	
Nuclear Properties	

Topics

Reference Text

- Uranium Processing

Uranium Processing to Green Salt

Mining

Milling

Conversion

Uranium Processing, Green Salt to Metal

Orange Salt

Green Salt

Metal

Purification

Uranium Metal Processing

Conversion of DU Derby to Components

Conversion of DU Derby to Rod

Conversion of DU Rod to Penetrator

Hazards Associated with Mechanical Processes

Hazards Associated with Machining/Lathing

- Radiation Physics

Natural Radiation

Manmade Radiation

Atomic Structure

Isotopes

Chapter 1, pages 5-33

pages 49-53

Topics

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Reference Text

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Radioactive Decay	
Properties of Ionizing Radiation	
Radiation Quantities and Units	
Types of Radiation Exposure	
- <u>Radiation Biology and Toxicology</u>	Chapters 1, pages 31-41
Radionuclide Pathways Into the Body	Chapter 5, pages 3-37
Radionuclide Transport Within the Body	Chapter 7, pages 6-13
Maximum Permissible Concentrations	
Threshold Limit Value	
- <u>Radiation Protection Program Surveillance</u>	Chapter 4, pages 5-35
Program Administration	
Radiological Measurements	
Protective Measures	
- <u>Dosimetry and Instrumentation</u>	Chapter 2, pages 5-52
Personnel Dosimetry Program	
Personnel Dosimetry Types	
Factors in Accurate Dose Assignment	
Radiation Detector Instruments	
Demonstration Workshop	

Topics

Reference Text

- Depleted Uranium Storage and Transportation
  - Typical Radiation Levels
  - Transportation and Mechanical Damage
  - Demilitarization
  
- Aerosol Sampling and Environmental Monitoring
  - Aerosol Sampling
    - Respirable Particulates Chapter 4, pages 21-23
    - Routine Air Sampling Chapter 5, page 6
    - Selection of Sampling Locations and Equipment Chapter 13, pages 5-50
    - Sampling Frequency
    - Records
  
  - Environmental Monitoring
    - Relationship to Radiation Safety Program Chapter 4, page 30
    - Elements of the Environmental Monitoring Program Chapter 3, page 8
    - Records Requirements
  
- Fire Hazards of Depleted Uranium Munitions
  - Heat Test (XM774)
  - Heat Test (XM829)
  - Los Alamos Heat Test

Topics

Reference Text

EMERGENCY RESPONSE

- Depleted Uranium Munitions Impact Testing  
Testing Hard and Soft Target Range  
Operations

- Recovery and Restoration  
Property  
Equipment  
Approvals

- Waste Management

Chapter 7, pages 14-16  
pages 31-44

Chapter 10, pages 3-14



DEPARTMENT OF THE ARMY  
**CERTIFICATE OF TRAINING**

This is to certify that

MAJ ARTHUR G. SAMILJAN

has successfully completed

LASER MICROWAVE HAZARDS WORKSHOP 6H-17  
25 - 29 April 1988

Given at US Army Environmental Hygiene Agency

*Arthur B. Webb*

ARTHUR B. WEBB  
LTC, MS  
C, Laser Microwave Division

1. USE OF LASERS IN INDUSTRY AND SOCIETY
2. USE OF LASERS IN G. M. OF CANADA
3. BASIC CONCEPTS AND LASER LIGHT PROPERTIES
4. BIOLOGICAL EFFECTS OF LASER LIGHT
5. HAZARDS OTHER THAN LIGHT
6. LASER CLASSIFICATION
7. CONTROL MEASURES



DEPARTMENT OF THE ARMY  
**CERTIFICATE OF TRAINING**

This is to certify that

MAJ ARTHUR G. SAMILJAN

has successfully completed

AMEDD PHYSICS AND MILITARY MEDICINE COURSE  
26 - 30 Oct 87

Given at US Army Environmental Hygiene Agency

RALPH R. CARESTIA, COLONEL, MS  
Director, Radiation and Environmental  
Sciences

OFFICIAL RECORD COPY ME 10



# The United States Air Force



CERTIFIES THAT

MAJ ARTHUR G. SAMILJAN

HAS SUCCESSFULLY COMPLETED THE  
SENIOR OFFICER NUCLEAR ACCIDENT COURSE (G30ZP0515-001)  
KIRTLAND AIR FORCE BASE, NEW MEXICO 87117  
PDS CODE: NPR DURATION: 3 DAYS (24 HRS)  
AND IS HEREWITH AWARDED THIS

## Certificate of Training

WALTER L. BRADSHAW III, Lt Col, USAF  
Commander  
Interservice Nuclear Weapons School

27 Apr 89  
DATE



**This is to Certify that**

---

ART. SAMILJAN

**has successfully completed**

*Scinta, inc.*

(40 Hours)

5-9 June 1989

**MANAGEMENT OF RADIATION ACCIDENTS and  
EMERGENCY PREPAREDNESS TRAINING COURSE**

**Bernard Shleien, Pharm. D.  
Certified Health Physicist  
American Board of Health Physics  
President, Scinta, Inc.**

# MANAGEMENT OF RADIATION ACCIDENTS and EMERGENCY PREPAREDNESS TRAINING COURSE

## AGENDA

Monday, June 5, 1989

8:30 Introduction

Overview - Dr. B. Shleien  
Pretest - R. Johnson

9:15 Radiation and Radioactivity -

Radiation Basics and Units - T. Osborne

10:15 Coffee

10:30 Sources of Radiation - B. Shleien

11:15 Radiation Bioeffects - B. Shleien

12:00 Lunch

1:00 Principles of Radiation Protection - R. Johnson

1:30 Radiation Standards - R. Johnson

2:00 Coffee

2:15 Radiation Survey Instruments and Operations - T. Osborne

3:00 Exercise - T. Osborne

Demonstration and Use of Survey Meters, Pocket Dosimeters,  
Air Samplers.

Monitoring Exercise

5:00 Adjourn

# Wednesday, June 7, 1989

8:30 **Protective Action Guides and Protective Actions - B. Shleien**

Plume Pathway  
Ingestion Pathway  
Thyroid Blocking  
Access Control  
Respiratory Protection  
Sheltering  
Evacuation  
Potassium Iodide  
Protective Actions for Food Chain

9:30 **Coffee**

9:45 **Pre-Hospital Response to Accidents - Video**

10:15 **Radioactive Contamination at the Accident Site - R. Johnson**

Contamination Control  
Surface Contamination Guides  
Measuring Ground Contamination  
Decontamination Procedures  
Air Monitoring  
Herbage Sampling  
Milk Measurements  
Whole Body Counting and Bioassay  
Meteorological Factors

11:30 **SOP's for Police, Firemen, and First Responders - B. Shleien**

12:15 **Lunch**

1:15 **Exercise - T. Osborne**

Hotline and Contamination Control  
Protective Clothing  
Respiratory Protection

2:00 **Writing an Emergency Response Plan -  
B. Shleien, R. Johnson, T. Osborne**

Radiation Accident at a Storage Facility  
Materials Common to U.S. Army Facilities

5:00 **Adjourn**

U.S. Army

This is to certify that

MAJOR ARTHUR G. SAMILJAN

has successfully completed the

MEDICAL X-RAY SURVEY TECHNIQUES COURSE  
6H-F18/323-F18

Given at Fort Sam Houston, Texas

from 15 April 1991 to 26 April 1991

*Dr. C. Hobough*  
Colonel, DC, Dean  
Medical Field Service School

*Paul R. Sheller*  
Colonel, MC  
Acting Commandant

512-221  
512-6632

5H-F18 CLASS 91-1 TEACHING SCHEDULE

WEEK NUMBER: 1

DAY NUMBER: 1

Day	Date	Start	Stop	LP No.	Subject	Instructor	Remarks
MON	15-04-1991	07:00	07:40	85-999-101	Inprocessing	Pavlick	Bring course notebooks for students, post classroom number on door of 0410, remind students to always bring scientific calculator
		07:40	08:00	76-350-332	Radiation Safety Briefing	Bland	Read Christensen's Chapter 26 (pp 401 - 406), DD 1952, Slides
		08:00	08:20	85-999-102	Course Opening	Gaston	
		08:30	09:10	76-350-300	Overview of Diagnostic Radiology	Bresell	Slides
		09:20	11:00	76-350-305	Production of X-rays	Lee	Read Christensen's Chapter 2, Slides
		11:10	11:55	76-350-900	Lunch	Staff	
		12:05	13:50	76-350-310	X-ray Generators	Bland	Read Christensen's Chapter 3, Slides
		14:00	15:10	76-350-315	Interactions Between X-rays and Matter	Schlapper	Read Christensen's Chapter 4, Slides
		15:20	16:35	76-350-320	Attenuation of X-rays	Collins	Read Christensen's Chapter 5, Slides

DAY NUMBER: 2

Day	Date	Start	Stop	LP No.	Subject	Instructor	Remarks
TUE	16-04-1991	07:30	09:10	76-350-325	Measurement of X-rays	Lee	Read Mimeo 76-350-325 Prior to Class, Slides
		09:20	10:05	76-350-330	Filters, Collimators, and Grids	Collins	Read Christensen's Chapters 6, 7, and 8, Slides
		10:15	11:00	76-350-355	The Image Receptor	Schlapper	Read Christensen's Chapters 10 and 11, Slides
		11:10	11:55	76-350-395	Operation and Limitation of Selected	Collins	Slides, MDH, Timer, Light Meter, kVp Meter

6H-F18 CLASS 91-1 TEACHING SCHEDULE

14:00 16:35 76-350-380 Federal Performance Standards Martin Browse 21 CFR Subchapter J, TB MED 521, Slides

DAY NUMBER: 4

Day	Date	Start	Stop	LP No.	Subject	Instructor	Remarks
HR	18-04-1991	07:30	08:10	76-350-350	Review of Labs II - IV	Bresell	
		08:25	11:55	76-350-425	Lab VII - Survey of Mobile Units	Staff	Group A - Lab VII; X-ray Survey Kit
		08:25	11:55	76-350-420	Lab VIII - Survey of Fluoroscopic Unit	Staff	Group B - Lab VIII; X-ray Survey Kit
		08:25	11:55	76-350-415	Lab IX - Survey of General Purpose Radiographic Unit	Staff	Group C - Lab IXb; X-ray Survey Kit
		08:25	11:55	76-350-415	Lab IX - Survey of General Purpose Radiographic Unit	Staff	Group D - Lab IXa; X-ray Survey Kit
		12:05	12:55	76-350-900	Lunch	Staff	
		13:05	16:35	76-350-420	Lab VIII - Survey of Fluoroscopic Unit	Staff	Group A - Lab VIII; X-ray Survey Kit
		13:05	16:35	76-350-425	Lab VII - Survey of Mobile Units	Staff	Group B - Lab VII; X-ray Survey Kit
		13:05	16:35	76-350-415	Lab IX - Survey of General Purpose Radiographic Unit	Staff	Group C - Lab IXa; X-ray Survey Kit
		13:05	16:35	76-350-415	Lab IX - Survey of General Purpose Radiographic Unit	Staff	Group D - Lab IXb; X-ray Survey Kit

DAY NUMBER: 5

Day	Date	Start	Stop	LP No.	Subject	Instructor	Remarks
FRI	19-04-1991	07:30	11:00	76-350-415	Lab IX - Survey of General Purpose Radiographic Unit	Staff	Group A - Lab IXa; X-ray Survey Kit

5H-F18 CLASS 91-1 TEACHING SCHEDULE

14:00	15:40	76-350-375	Legal Aspects of Occupational Exposure	Schlapper	Slides, Calculators
15:50	16:35	85-999-103	Open (Research/Study)	Staff	

DAY NUMBER: 2

Day	Date	Start	Stop	LP No.	Subject	Instructor	Remarks
TUE	23-04-1991	07:30	08:15	76-350-470	Organ Dose Estimation in Diagnostic	Bland	Slides, Overheads, Scientific Calculator
		08:25	09:10	76-350-475	Selected Diagnostic X-ray Radiation Protection Survey	Schlapper	Slides
		09:20	10:05	76-350-500	JCAHO Standards	Marx	Slides, Overheads, Scientific Calculator
		10:15	11:55	76-350-900	Lunch	Staff	
		12:05	16:35	76-350-385	X-ray Survey Data Analysis Practical Exercise	Bresell	X-ray Survey Form, Overheads, Calculator

DAY NUMBER: 3

Day	Date	Start	Stop	LP No.	Subject	Instructor	Remarks
WED	24-04-1991	07:30	09:25	76-020-435	Examination II: Survey of General Purpose	Staff	Group 1a - Exam IIb, X-ray Survey Kit
		07:30	09:25	76-020-435	Examination II: Survey of General Purpose	Staff	Group 2a - Exam IIa; X-ray Survey Kit
		07:30	09:25	76-020-445	Examination IV: Survey of Mobile Unit	Staff	Group 3a - Exam IV; X-ray Survey Kit
		07:30	09:25	76-020-440	Examination III: Survey of Fluoroscopic Unit	Staff	Group 4a - Exam III; X-ray Survey Kit
		07:30	09:10	76-010-395	Examination I: Principles of X-ray Production, Image	Staff	Group B - Exam I; Scientific Calculator

6H-F18 CLASS 91-1 TEACHING SCHEDULE

14:30	16:35	85-999-103	Open (Research/Study)	Staff	Group B
14:35	16:30	76-020-440	Examination III: Survey of Fluoroscopic Unit	Staff	Group 1a - Exam III; X-ray Survey Kit
14:35	16:30	76-020-445	Examination IV: Survey of Mobile Unit	Staff	Group 2a - Exam IV; X-ray Survey Kit
14:35	16:30	76-020-435	Examination II: Survey of General Purpose	Staff	Group 4a - Exam IIb; X-ray Survey Kit
14:35	16:30	76-020-435	Examination II: Survey of General Purpose	Staff	Group 3a - Exam IIa; X-ray Survey Kit

DAY NUMBER: 4

Day	Date	Start	Stop	LP No.	Subject	Instructor	Remarks
THR	25-04-1991	07:30	09:25	76-020-435	Examination II: Survey of General Purpose	Staff	Group 1b - Exam IIb; X-ray Survey Kit
		07:30	09:25	76-020-435	Examination II: Survey of General Purpose	Staff	Group 2b - Exam IIa; X-ray Survey Kit
		07:30	09:25	76-020-445	Examination IV: Survey of Mobile Unit	Staff	Group 3b - Exam IV; X-ray Survey Kit
		07:30	09:25	76-020-440	Examination III: Survey of Fluoroscopic Unit	Staff	Group 4b - Exam III; X-ray Survey Kit
		07:30	09:10	76-010-395	Examination I: Principles of X-ray Production, Image	Staff	Group A, Scientific Calculator
		09:20	09:50	85-999-103	Open (Research/Study)	Staff	Group A
		10:00	10:45	76-350-405	Exam I Critique	Lee	Group A

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6H-F18 CLASS 91-1 TEACHING SCHEDULE

14:35	16:30	76-020-445	Examination IV: Survey of Mobile Unit	Staff	Group 2b - Exam IV; X-ray Survey Kit
14:35	16:30	76-020-435	Examination II: Survey of General Purpose	Staff	Group 4b - Exam IIb; X-ray Survey Kit
14:35	16:30	76-020-435	Examination II: Survey of General Purpose	Staff	Group 3b - Exam IIa; X-ray Survey Kit

DAY NUMBER: 5

Day	Date	Start	Stop	LP No.	Subject	Instructor	Remarks
-----	-----	-----	-----	-----	-----	-----	-----
FRI	26-04-1991	07:30	10:05	76-350-445	Radiation Protection Program Management Seminar	Staff	
		10:15	11:00	76-999-101	Critique and Graduation	Gaston	Critique Sheets

NUCLEAR WEAPON INCIDENT SEMINAR- 7-8 MAR 1991

AGENDA

7 MAR

0630-0755	REGISTRATION/CONTINENTAL BREAKFAST (COLLECTION OF ORDERS)	
0800	OVERVIEW/SEMINAR OBJECTIVES	CAPT S. M. MONDUL, USN DIRECTOR OF OPERATIONS
0810	WELCOMING REMARKS	RADM B. E. TOBIN, JR., USN COMMANDER, NAVA BASE, NORFOLK, VA
0820	CINCLANTFLT REMARKS	MR. WILLIAM H. AUSTIN, JR. NUCLEAR WPNS READINESS OFFICER
0830	DAMASCUS, ARKANSAS INCIDENT '80 15 MIN VHS TAPE	CAPT S. M. MONDUL, USN DIRECTOR OF OPERATIONS
0850	INITIAL RESPONSE FORCE	CDR S. KOTZ, USN PUBLIC WORKS OFFICER/ DISASTER PREPAREDNESS OFFICER
0920	SERVICE RESPONSE FORCE OPS	CAPT S.M. MONDUL, USN DIRECTOR OF OPERATIONS
0950	SECURITY	CAPT DONALD R. DENAULT, USN DIRECTOR OF SECURITY
1020	BREAK	
1035	WEAPONS RECOVERY	CAPT MICHAEL A. MURRAY, USN COMEODGRUTWO (PRI) CDR THOMAS M. LIGON, USN CHIEF STAFF OFFICER (SEC)

1105	PUBLIC AFFAIRS	LCDR MIKE TODD, USN PUBLIC AFFAIRS OFFICER MRS JUDY CONDRA, DEPUTY PAO (SEC)
1135	LUNCH	
1230	FLTIMGCOMLANT	LT STEVEN M. HOWELL, USN FLTIMAGCOMLANT
1300	COMMUNICATIONS	MR. PAUL W. POISSON AREA OPERATIONS OFFICER
1330	LOGISTIC SUPPORT	LCDR STAN HETTICH, USN SRF SUPPLY & PROCUREMENT OFFICER
1400	LEGAL	CAPT JOHN P. CLUM, USN STAFF JUDGE ADVOCATE
1430	BREAK	
1450	RECOVERY OPERATIONS	LCDR ROBERT EADIE, USN BASE CIVIL ENGINEER
1520	RADIOLOGICAL HEALTH/SAFETY	CDR J. P. McBRIDE, MC NUCLEAR MEDICINE OFFICER/ LCDR ANTHONY R. PULCRANO, MSC RADIATION HEALTH OFFICER
1550	FRIGID DIGIT 90 EXERCISE/ LESSONS LEARNED	CAPT ROGER A. FRANCIS/ CDR MICHAEL D. TEMPLE NLO FEMA REGION X

1620 GROUP/OPEN DISCUSSION

MR. STEVE GIBSON  
DEPUTY DIRECTOR OPERATIONS

1700 ADJOURN

1730-  
1930 COCKTAIL HOUR (CASH BAR)

8 MAR

0700 CONTINENTAL BREAKFAST

0800 ADMINISTRATIVE COMMENTS

CAPT S.M. MONDUL, USN  
DIRECTOR OF OPERATIONS

0815 NUCLEAR WEAPON SAFETY

LCDR LOUIS F. RILL, USN  
HEAD OF THE TECHNICAL  
INSPECTION DEPT.

0830 DEPARTMENT OF ENERGY RESPONSE  
CAPABILITIES

MR. STEVEN H. CHAPMAN  
U.S. DEPARTMENT OF ENERGY

0900 FEDERAL EMERGENCY MANAGEMENT  
AGENCY

MR. VERNON WINGERT  
CHIEF OF PROGRAM  
DEVELOPMENT BRANCH

0930 NUCLEAR WEAPONS SAFETY  
12 MIN VHS TAPE

OFFICE OF THE CHIEF OF  
NAVAL OPERATIONS

0950 BREAK

1015	U.S. ARMY RADIOLOGICAL CONTROL TEAM (RADCON)	MR. JOSEPH M. SANTASIERO CHIEF, RADIOLOGICAL ENGINEERING BRANCH (PRI) MR. STEVEN A. HORNE CHIEF, CECOM SAFETY OFFICE (SEC)
1045	U.S. ARMY RADIOLOGICAL ADVISORY MEDICAL TEAM	MAJ ARTHUR G. SAMILJAN USA, WALTER REED ARMY MEDICAL CENTER
1115	INTER-SERVICE NUCLEAR SCHOOL (SONAC/FONAC) ORIENTATION	MAJ ROBERT SIMMONS, USMC BRANCH CHIEF
1145	LUNCH (1300-1330 HOTEL CHECKOUT, LUGGAGE STORAGE AVAILABLE AT THE BELLMAN'S STATION)	
1330	GROUP/OPEN DISCUSSION	MR. STEVE GIBSON DEPUTY DIRECTOR OPERATIONS
1400	CLOSING REMARKS	CAPT S.M. MONDUL, USN DIRECTOR OF OPERATIONS
1415	BREAKOUT SEMINAR/PM SODA	
1430	CLOSE- DISTRIBUTION OF ORDERS	

UNIVERSITY OF FLORIDA  
GAINESVILLE FLORIDA 32611

PAGE

DATE PRINTED

STUDENT NO. 6

1

JANUARY 07, 1986

STUDENT NAME

LAST: SAMILJAN

FIRST: ARTHUR

MIDDLE: G

01

7EG

RESIDENCE  
FLA

MAJOR: ENE

SEX  
M

HIGH SCHOOL LAST ATTENDED

ALL COURSE WORK ON THIS TRANSCRIPT IS RECORDED IN

SEMESTER HOURS

QUARTER HOURS

SAMILJAN ARTHUR G

TEST SCORES  
GRE TOT 1060  
VRB QUN ANL  
550 510 580

BASIS OF ADMISSION

HIGH SCHOOL  
 TRANSFER  
 OTHER

STUDENT IS IN GOOD STANDING AND IS ELIGIBLE TO RETURN UNLESS OTHERWISE STATED. THIS TRANSCRIPT IS NOT OFFICIAL UNLESS IT BEARS THE EMBOSSED SEAL OF THE UNIVERSITY.

COURSE TYPE  
BLANK - INST. CREDIT  
Z  
Y  
A  
-CLEP  
-ADV. PLACEMENT  
-ACT PROGRAM  
-OTHER EXT. CR.  
-GRADE FORGIVEN  
-TRANSFER REPEAT COURSE, NO CREDIT

G-CSE NOT APP TO UF DEG.  
AU-AUDIT, NO CREDIT  
L-CREDIT, BELOW ACCEPTABLE LEVEL  
V-NO CREDIT VOCATIONAL TECH  
R-REPEAT COURSE, NO CREDIT  
S-NO CREDIT, UNDER SUSPENSION  
M-REPEATED, CREDIT ALLOWED  
NO CREDIT

GRADE SYSTEM

A - 4.0 GP  
B+ - 3.5 GP  
B - 3.0 GP

EXCELLENT  
GOOD

C+ - 2.5 GP  
C - 2.0 GP  
D+ - 1.5 GP  
D - 1.0 GP

AVERAGE  
POOR

E - 0.0 GP  
W - 0.0 GP  
WF - 0.0 GP  
EW - 0.0 GP  
I - 0.0 GP  
X - 0.0 GP

FAIL  
WITHDREW  
WITHDREW FAIL  
DROPPED NON ATTEND.  
INCOMPLETE  
ABSENT FROM EXAM

S - SATISFACTORY  
S+ - LAW SCHOOL HON.  
P - PASSING

N - NO CREDIT  
U - UNSATISFACTORY  
H - DEFERRED  
AU - AUDIT-NO CREDIT

COURSE

SEM/QTR CREDITS

COURSE

SEM/QTR CRE:

PREFIX & CSE NO.	TITLE	TYPE	GRADE	COURSE CREDIT	CREDIT EARNED	CREDIT FOR GPA	PREFIX & CSE NO.	TITLE	TYPE	GRADE	COURSE CREDIT	CREDIT EARNED	CREDIT FOR GPA
UNIV	RECEIVED THE DEGREE BACHELOR OF ARTS						UNIVERSITY OF FLORIDA	1985 SUMMER					
								MAY-JUNE - 6 WEEKS					
							CHM 3200	ORGANIC CHEMISTRY		C	0300	0300	0300
							EARNED HRS	3.00 GRADE PTS			6.00	HRS CARRIED	3.00
UNIV	RECEIVED THE DEGREE MASTER OF EDUCATION						UNIVERSITY OF FLORIDA	1985 SUMMER					
								MAY-AUGUST - 12 WEEKS					
							ENV 6211 L	HEALTH PHYSICS LAB		A	0200	0200	0200
							STA 6166	STAT METH RES 1		C	0400	0400	0400
							EARNED HRS	6.00 GRADE PTS			16.00	HRS CARRIED	6.00
UNIVERSITY OF FLORIDA	ADMITTED TO GRADUATE SCHOOL	7EG					UNIVERSITY OF FLORIDA	1985 FALL					
5005	FUND OF REACTOR ENG		B	0300	0300	0300	EES 5105	ENVIRONMENTAL BIOLOGY		B	0300	0300	0300
6061	INTRO MED RADIOL PHYS		B	0100	0100	0100	ENU 5615	NUC RAD DETEC/INSTRU		B	0300	0300	0300
6006	GRAD ENV ENGR SEMINAR		S	0100	0100	0100	ENU 5615 L	NUC RAD DETEC/INST LB		A	0100	0100	0100
6211	HEALTH PHYSICS		C+	0300	0300	0300	ENV 5005	ENVIRONMENTAL HEALTH		B+	0300	0300	0300
6236	RADIOLOGICAL TECHNIQUES		B	0400	0400	0400	ENV 6916	NON-THESIS PROJECT		A	0200	0200	0200
EARNED HRS	12.00 GRADE PTS			31.50	HRS	CARRIED	11.00						
UNIVERSITY OF FLORIDA		7EG						1985 SPRING					
3212	COMPU PROG FOR ENGRS		C	0200	0200	0200		AWARDED MASTER OF SCIENCE					
6207	ENVIRONMENTAL CHEM		B	0300	0300	0300		GRADUATED DEC 21 1985					
5626	RADIATION BIOLOGY		B+	0400	0400	0400		MAJOR ENVIRONMENTAL ENGINEERING SCI					
6006	GRAD ENV ENGR SEMINAR		A	0100	0100	0100	EARNED HRS	12.00 GRADE PTS			40.50	HRS CARRIED	12.00
6216	RADIOACTIVE WASTES		A	0300	0300	0300	CUM EARNED HRS	47.00 GRP			141.00	HRS CARRIED	46.00
6932	POST-ACCIDENT SAMPLE		A	0100	0100	0100							
EARNED HRS	14.00 GRADE PTS			47.00	HRS	CARRIED	14.00						

END OF TRANSCRIPT. MAY NOT BE RELEASED TO THIRD PARTY WITHOUT STUDENT PERMISSION

115017

MATERIALS LICENSE

Amendment No. 22

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		In accordance with letter dated February 28, 1994,	
1. Department of the Army Walter Reed Army Medical Center		3. License number 08-01738-03 is amended in its entirety to read as follows:	
2. Washington, D.C. 20307-5001		4. Expiration date November 30, 1996	
		5. Docket or Reference No. 030-06895	
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. Cobalt 60	A. Sealed sources (AECL Models C-166, C-167 or C-198)	A. 3,500 curies per source and 70,000 curies total	
B. Cesium 137	B. Sealed sources (AECL Model C-161 Type 8)	B. 2,100 curies per source and 8,400 curies total	
C. Cesium 137	C. Sealed sources	C. <input type="checkbox"/> per source and <input type="checkbox"/> total	
9. Authorized use			
A. To be used in AECL Gammacell 220 irradiator for medical research and development and radiation dosimetry.			
B. To be used in AECL Gammacell 40 Irradiator for small animal irradiation, medical research, development and radiation dosimetry.			
C. To be used in a <input type="checkbox"/> Irradiator to irradiate blood products.			

CONDITIONS

- 10. License material shall be used at WRAMC, Washington, D.C.
- 11. A. Licensed material shall be used by individuals who have satisfactorily completed the training program outlined in the application dated March 18, 1991 and have been designated by the individual approved by the Radiation Control Committee. Records of training shall be maintained by the licensee.
- B. The Radiation Safety Officer for this license is CPT Mark A. Melanson, CHP.

Information in this record was deleted in accordance with the Freedom of Information Act, Exemptions 2 & 6  
2006-0238

EX 2  
OFFICIAL RECORD COPY

ML 10

JJ/17

MATERIALS LICENSE  
SUPPLEMENTARY SHEET

License number

08-01738-03

Docket or Reference number

030-06895

Amendment No. 22

(Continued)

CONDITIONS

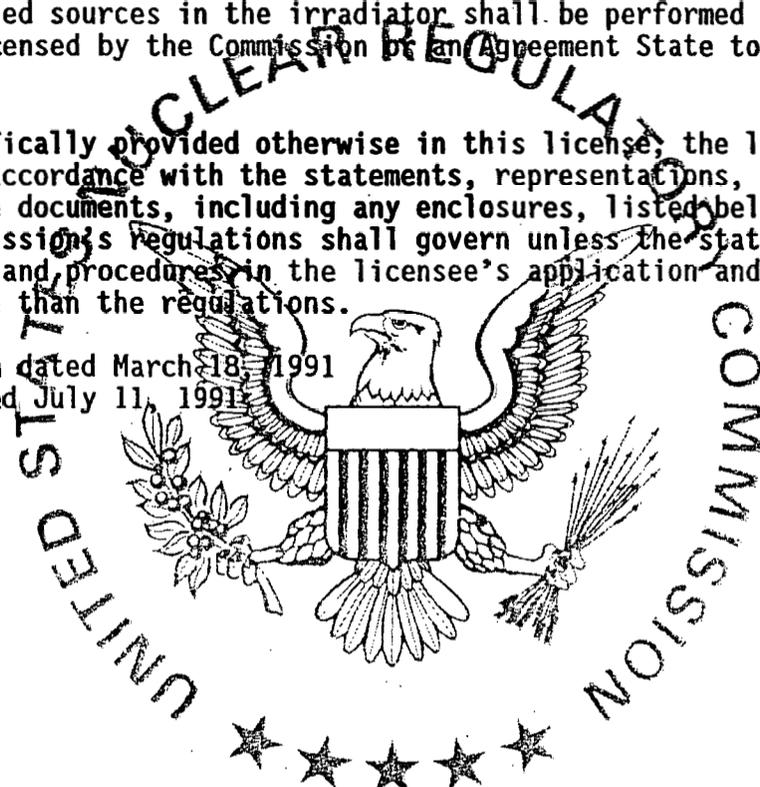
12. Sealed sources containing licensed material shall not be opened.
13. A. Sealed sources and detector cells shall be tested for leakage and/or contamination at intervals not to exceed 6 months or at such other intervals as are specified by the certificate of registration referred to in 10 CFR 32.210, not to exceed 3 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 3 months.
- C. In the absence of a certificate from a transferor indicating that a 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.
- E. Sealed sources and detector cells need not be leak tested if:
- (i) they contain only hydrogen 3 or
  - (ii) they contain only a 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. Records of leak test results shall be kept in units of microcuries and shall be maintained for inspection by the Commission. 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 shall be removed from service and decontaminated, repaired, or disposed of in accordance with Commission regulations. The report shall be filed within 5 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 involved, the test results, and corrective action taken.

MATERIALS LICENSE  
SUPPLEMENTARY SHEET

License number	08-01738-03
Docket or Reference number	030-06895
Amendment No. 22	

(13. Continued) CONDITIONS

- G. The licensee is authorized to collect leak test samples for analysis by individuals approved by the Radiation Control Committee. 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.
- 14. 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 a person specifically licensed by the Commission or an Agreement State to perform such services.
- 15. 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 March 18, 1991
  - B. Letter dated July 11, 1991



Date APR 18 1994

For the U.S. Nuclear Regulatory Commission  
 United States Nuclear Regulatory Commission  
 By \_\_\_\_\_  
 Nuclear Materials Safety Branch  
 Region I  
 King of Prussia, Pennsylvania 19406

APR 18 1994

License No. 08-01738-03  
Docket No. 030-06895  
Control No. 119388

Department of the Army  
ATTN: Peter H. Myers, Lt. Colonel  
HQDA (DASG-PSP)  
5109 Leesburg Pike  
Falls Church, Virginia 22041-3258

Dear Lt. Colonel:

Please review the enclosed document carefully and be sure that you understand all conditions. If there are any errors or questions, please notify the U.S. Nuclear Regulatory Commission, Region I office, the Licensing Assistance Section, (610) 337-5093 or 5239, so that we can provide appropriate corrections and answers.

Please be advised that your license expires at the end of the day, in the month, and year stated in the license. Until your license is terminated, you must conduct your program involving byproduct materials in accordance with the conditions of your NRC license, representations made in your license application, and NRC regulations. In particular, note that you must:

1. Operate in accordance with NRC regulations 10 CFR Part 19, "Notices, Instructions and Reports to Workers; Inspections," 10 CFR Part 20, "Standards for Protection Against Radiation," and other applicable regulations.
2. Notify NRC, in writing, within 30 days:
  - a. when the licensee's mailing address changes (no fee is required if the location of byproduct material remains the same).
3. In accordance with 10 CFR 30.36(b) and/or license condition, notify NRC, promptly, in writing, and request termination of the license:
  - a. when you decide to terminate all activities involving materials authorized under the license; or

- b. if you decide not to complete the facility, acquire equipment, or possess and use authorized material.
4. Request and obtain a license amendment before you:
  - a. change Radiation Safety Officers;
  - b. order byproduct material in excess of the amount, or radionuclide, or form different than authorized on the license;
  - c. add or change the areas of use, or address or addresses of use identified in the license application or on the license; or
  - d. change ownership of your organization.
5. Submit a complete renewal application with proper fee or termination request at least 30 days before the expiration date of your license. You will receive a reminder notice approximately 90 days before the expiration date. Possession of byproduct material after your license expires is a violation of NRC regulations. A license will not normally be renewed, except on a case-by-case basis, in instances where licensed material has never been possessed or used.

In addition, please note that NRC Form 313 requires the applicant, by his/her signature, to verify that the applicant understands that all statements contained in the application are true and correct to the best of the applicant's knowledge. The signatory for the application should be the licensee or certifying official rather than a consultant.

You will be periodically inspected by the NRC. Failure to conduct your program in accordance with NRC regulations, license conditions, and representations made in your license application and supplemental correspondence with NRC will result in enforcement action against you. This could include issuance of a notice of violation, or 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.

Since serious consequences to employees and the public can result from failure to comply with NRC requirements, prompt and vigorous enforcement action will be taken when dealing with licensees who do not achieve the necessary meticulous attention to detail and the high standard of compliance which NRC expects of its licensees.

Thank you for your cooperation.

Sincerely,

**Original Signed By:**  
**Thomas K. Thompson**

Thomas K. Thompson  
Senior Health Physicist  
Nuclear Materials Safety Branch  
Division of Radiation Safety  
and Safeguards

Enclosures:

1. Amendment No. 22
2. Requirements for Materials Licensees

*TKT*  
DRSS:RI  
Thompson/srb

4/11/94



REPLY TO  
ATTENTION OF

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



February 28, 1994

030-06895

Preventive 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 08-01738-03, Walter Reed Army Medical  
Center, Washington, DC, by appointing Captain Mark A. Melanson  
as Radiation Safety Officer.

Recommend approval.

Sincerely,

Peter H. Myers  
Colonel, U.S. Army  
Radiological Hygiene Consultant

Enclosure

CF: HQ, USAEHA, ATTN: HSHB-MR-H, APG, MD 21010-5422  
HQ, USWRAMC, ATTN: HSHL-HP, Wash, DC 20307-5001

**FEE EXEMPT**

119388

MAR 7 1994

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DEPARTMENT OF THE ARMY  
WALTER REED ARMY MEDICAL CENTER  
WASHINGTON, DC 20307-5001



REPLY TO  
ATTENTION OF:

HSHL-HP (385-11m)

17 February 1994

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

SUBJECT: Amendment of U.S. Nuclear Regulatory Commission License  
No. 08-01738-03.

1. Request that NRC License No. 08-01738-03 for Walter Reed Army Medical Center be amended to reflect a change in the Radiation Safety Officer from LTC Arthur G. Samiljan to CPT Mark A. Melanson, CHP. CPT Melanson has been assigned as the Chief, Health Physics Office at Walter Reed AMC since February 1994. Before that he was the Chief, Operations Branch of the Health Physics Office and alternate RSO at WRAMC since June 1991. A Training and Experience Form and a Curriculum Vitae for CPT Melanson are attached (Enclosures 1 and 2).

2. If any additional information is required please contact Mr. David Burton or CPT Melanson at (301) 427-5161.

FOR THE COMMANDER:

2 Encls

  
EARL S. NEWSOME III  
LTC, MS  
Executive Officer

CF:  
CDR, HSC ATTN: HSCL-P  
HQDA (SGPS-PSP-E)

CURRICULUM VITAE OF  
MARK ALLEN MELANSON

PERSONAL DATA:

HOME ADDRESS:

SSN:

CITIZENSHIP:

MARITAL STATUS:

EDUCATION:

COLLEGE:

Dickinson College, Carlisle, PA  
B.S. Nuclear Physics, Mathematics

GRADUATE SCHOOL:

Johns Hopkins University  
School of Hygiene and Public Health  
M.S. Radiological Health

CERTIFICATION:

Comprehensive, American Board of  
Health Physics

EXPERIENCE:

OCT 83 - DEC 86

Radiation Safety Officer and  
Medical Physicist  
Department of Radiology  
Landstuhl Army Regional Medical  
Center, Landstuhl, West Germany  
4 Mammographic x-ray systems

DEC 86 - DEC 88

Consultant, Medical Physics  
Medical Physics Branch  
Health Physics Division  
US Army Environmental Hygiene Agency  
Aberdeen Proving Grounds, MD  
40 Mammographic x-ray systems

JUN 91 - PRESENT

Deputy Health Physics Officer  
Walter Reed Army Medical Center  
Washington, D.C.  
10 Mammographic x-ray systems

Societies and Affiliations:

American Association of Physicists in Medicine  
American Academy of Health Physics  
Health Physics Society  
Sigma Pi Sigma Physics Honor Society  
Delta Omega Public Health Honor Society  
Theta Chi Fraternity

Ex 6

**TRAINING AND EXPERIENCE  
OF AUTHORIZED RADIOISOTOPE USERS**

1. NAME OF AUTHORIZED USER (Last, First, MI) <b>MELANSON, Mark A.</b>				2. STATE OR TERRITORY IN WHICH LICENSED: <b>N/A</b> <i>(MD, DDS, DVM, etc.)</i>	
RANK/GRADE <b>CPT/0-3</b>	ORGANIZATION <b>HPO, WRAMC</b>	ORGANIZATIONAL DIVISION <b>HPO</b>	BLDG./ROOM NO. <b>186/5</b>	WRAMC AUTHORIZATION NO. <b>221</b>	

3. CERTIFICATION		
SPECIALTY BOARD A	CATEGORY B	MONTH AND YEAR CERTIFIED C
<b>ABHP</b>	<b>Comprehensive</b>	<b>11/92</b>

4. FORMAL EDUCATION			HIGHEST ACADEMIC DEGREE ATTAINED		
Higher Educational Institutions Attended	Type of Program Pursued and Dates of Attendance	Degree, Diploma or Certificate Received and Date			
a. <u>Johns Hopkins (JHU)</u>	<u>MS/Rad Hlth Sci</u>	<u>MS</u>			
b. <u>Dickinson College</u>	<u>BS</u>	<u>BS</u>			
c. _____	_____	_____			
d. _____	_____	_____			

5. TRAINING RECEIVED IN BASIS RADIOISOTOPE HANDLING TECHNIQUES					
FIELD OF TRAINING A	LOCATION AND DATE(S) OF TRAINING (Include course title if known) B	TYPE AND LENGTH OF TRAINING			
		LECTURE/LABORATORY COURSES (Hours) C		SUPERVISED LABORATORY EXPERIENCE (Hours) D	
a. RADIATION PHYSICS AND INSTRUMENTATION	JHU Dickinson	80	40	80	40
b. RADIATION PROTECTION	JHU Dickinson	80	40	80	40
c. MATHEMATICS PERTAINING TO THE USE AND MEASUREMENT OF RADIOACTIVITY	JHU Dickinson	80	40	80	40
d. RADIATION BIOLOGY	JHU Dickinson	80	40	80	40
e. RADIOPHARMACEUTICAL CHEMISTRY	JHU Dickinson	80	40	80	40

*Exp*

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
-131	200 mCi	LARMC, FRG	9/83 - 12/86	Therapy
C-99m	50 mCi	LARMC, FRG	9/82 - 12/86	Imaging
S-139	25 mCi	" "	" "	Calibration
l-201	75 mCi	" "	" "	Imaging
a-133	500 mCi	" "	" "	Pa+ Ma ke
o-57				
o-58	10 mCi	LARMC FRG	9/83 - 12/86	Calibration
a-67	3 mCi	" "	" "	Imaging
n-111	500 mCi	" "	" "	" "
-123	500 mCi	" "	" "	" "
-11	2 Ci	JHU	7/89 - 5/91	Imaging
-18	500 mCi	" "	" "	" "
a-226	50 mCi	" "	" "	Lab
-3	2 Ci	AEHA	12/86 - 12/88	Special Project

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

DEVICE	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
Neutron Howitzer			
u-239 Be	Dickinson College	9/79 - 5/83	Research
Diagnostic	MHPS, HPD, AEHA	12/86 - 12/88	Compliance
-Ray Systems			Surveys
Diagnostic	LARMC	9/83 - 12/86	" "
-Ray Systems			
Cobalt-60	AEHA	12/86 - 12/88	Calibration
0 Ci			
Food Irradiator	WRAMC	7/91 - Present	Blood
S-137 - 2,000 Ci			Treatment

CERTIFICATION:

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

15 Feb 97  
Date Signed

*Michael J. Brown*  
Signature of Applicant

MATERIALS LICENSE

Amendment No. 23

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.

<p>Licensee</p> <p>1. Department of the Army Walter Reed Army Medical Center</p> <p>2. Washington, D.C. 20307-5001</p>		<p>In accordance with the letter dated May 13, 1994,</p> <p>3. License number 08-01738-03 is amended in its entirety to read as follows:</p>	
		<p>4. Expiration date November 30, 1996</p>	
		<p>5. Docket or Reference No. 030-06895</p>	
<p>6. Byproduct, source, and/or special nuclear material</p> <p>A. Cesium 137</p> <p>B. Cesium 137</p> <p>C. Cesium 137</p>	<p>7. Chemical and/or physical form</p> <p>A. Sealed sources</p> <p>B. Sealed sources</p> <p>C. Sealed sources</p>	<p>8. Maximum amount that licensee may possess at any one time under this license</p> <p>A. Not to exceed 3500 curies per source and 70,000 curies total</p> <p>B. Not to exceed 2,100 curies per source and 8,400 curies total</p> <p>C. Not to exceed per source and total</p>	
<p>9. Authorized use</p> <p>A. In AECL Gammacell Model 220 Irradiator(s) for the irradiation of material except explosives, flammables, or corrosives.</p> <p>B. In AECL Gammacell Model 40 Irradiator(s) for the irradiation of material except explosives, flammables, or corrosives.</p> <p>C. In _____ Irradiator(s) for the irradiation of material except explosives, flammables, or corrosives.</p>			

CONDITIONS

- 10. Licensed material may be used only at the licensee's facilities located at Walter Reed Army Medical Center, Washington, D.C.
- 11. A. Licensed material shall only be used by, or under the supervision of, individuals who have received the training described in application dated March 18, 1991 and have been designated in writing by the Radiation Safety Officer.
- B. The Radiation Safety Officer for this license is LTC William B. Johnson.
- 12. Sealed sources or detector cells containing licensed material shall not be opened or sources removed from source holders by the licensee.

Information in this record was deleted in accordance with the Freedom of Information Act, exemptions 2 & 6  
2006-0238

EX 2  
OFFICIAL RECORD COPY ML 10

JJ/8

MATERIALS LICENSE  
SUPPLEMENTARY SHEET

License number:	08-01738-03
Docket or Reference number	030-06895
Amendment No. 23	

13. 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.
- 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 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.

**MATERIALS LICENSE  
SUPPLEMENTARY SHEET**

License number

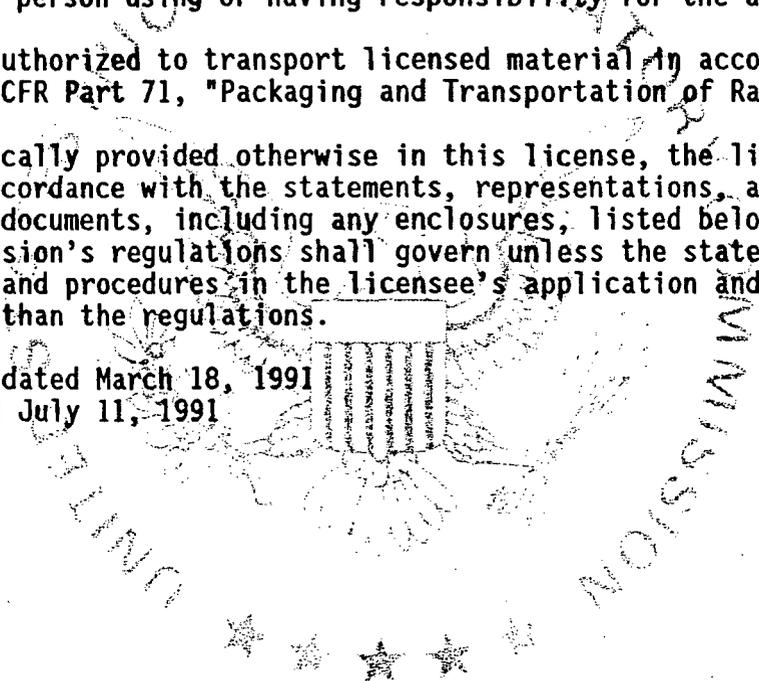
08-01738-03

Docket or Reference number

030-06895

Amendment No. 23

14. 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 Commission or an Agreement State to perform such services.
15. The licensee shall conduct a physical inventory every six months to account for all sealed sources and devices containing licensed material received and possessed under the license.
16. 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.
17. The licensee is authorized to transport licensed material in accordance with the provisions of 10 CFR Part 71, "Packaging and Transportation of Radioactive Material."
18. 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 March 18, 1991
  - B. Letter dated July 11, 1991



Date JUN 23 1994

For the U.S. Nuclear Regulatory Commission  
Original Signed By:  
Steve W. Shaffer

By \_\_\_\_\_  
Nuclear Materials Safety Branch  
Region I  
King of Prussia, Pennsylvania 19406

JUN 23 1994

License No. 08-01738-03  
Docket No. 030-06895  
Control No. 119857

Department of the Army  
ATTN: Peter H. Myers, Lt. Colonel  
HQDA (DASG-PSP)  
5109 Leesburg Pike  
Falls Church, Virginia 22041-3258

Dear Lt. Colonel:

This refers to your license amendment request. Enclosed with this letter is the amended license.

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, the Licensing Assistance Section, (610) 337-5093 or 5239, so that we can provide appropriate corrections and answers.

Thank you for your cooperation.

Sincerely,

Original Signed By:  
Steve W. Shaffer  
Steve W. Shaffer  
Nuclear Materials Safety Branch  
Division of Radiation Safety  
and Safeguards

Enclosure:  
Amendment 23  
DRSS:RI  
Shaffer/sws

*SW*  
6/23/94

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ML 10



REPLY TO  
ATTENTION OF

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

June 01, 1994

030-06895



Preventive 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 08-01738-03, Walter Reed Army Medical  
Center, Washington, DC, by appointing Lieutenant Colonel William  
B. Johnson as Radiation Safety Officer.

Recommend approval.

Sincerely,

Peter H. Myers  
Colonel, U.S. Army  
Radiological Hygiene Consultant

Enclosure

CF: HQ, USAEHA, ATTN: HSHB-MR-H, APG, MD 21010-5422  
HQ, USWRAMC, ATTN: HSHL-HP, Wash, DC 20307-5001 (wo/encls)

119857

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ML 90

JUN - 6 1994



DEPARTMENT OF THE ARMY  
WALTER REED ARMY MEDICAL CENTER  
WASHINGTON, DC 20307-5001



REPLY TO  
ATTENTION OF:

HSHL-HP (385-11)

13 May 1994

MEMORANDUM THRU

Commander, U.S. Army Health Services Command, ATTN: HSCL-P, Fort  
~~Sam Houston, Texas 78234-6000~~

*MAM*  
*26 MAY 94*

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

FOR U.S. Nuclear Regulatory Commission, Region I, Nuclear  
Safety Section A, 475 Allendale Road, King of Prussia,  
PA 19406

SUBJECT: Amendment of US Nuclear Regulatory Commission Licenses  
No. 030-01317 and No. 030-06895

1. Request that NRC Licenses 030-01317 and 030-06896 be amended to reflect a change in the Radiation Safety Officer from CPT Mark A. Melanson to LTC William B. Johnson. LTC Johnson has been assigned as the Chief, Health Physics Office at Walter Reed Army Medical Center since 9 May 1994.
2. A Training and Experience Form and a Curriculum Vitae for LTC Johnson are attached (Enclosures 1 and 2).
3. POC for this matter is Mr. David W. Burton or LTC Johnson @ (301)-427-5104/5107.

FOR THE COMMANDER:

2 Encls

FILE ENCL

*Earl S. Newsome III*  
EARL S. NEWSOME III  
LTC, MS  
Executive Officer

TRAINING AND EXPERIENCE  
 AUTHORIZED USER OR RADIATION SAFETY OFFICER

1. NAME OF AUTHORIZED USER OR RADIATION SAFETY OFFICER  WILLIAM B. JOHNSON, Ph.D.	2. STATE OR TERRITORY IN WHICH LICENSED TO PRACTICE MEDICINE: NOT APPLICABLE
---	---

3. CERTIFICATION		
SPECIALTY BOARD A	CATEGORY B	MONTH & YEAR CERTIFIED C
NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE

4. TRAINING RECEIVED IN BASIC RADIOACTIVE HANDLING TECHNIQUES			
FIELD OF TRAINING A	LOCATION AND DATE(S) OF TRAINING B	TYPE & LENGTH OF TRAINING	
		LECTURE/ LABORATORY COURSES (Hours) C	SUPERVISED LABORATORY EXPERIENCE (Hours) D
a. RADIATION PHYSICS AND INSTRUMENTATION	1) Univ of North Carolina, Chapel Hill, NC, 1980-1983 (3 years) 2) Tulane, New Orleans, LA, 1976 (1 year) 3) Ft. Belvoir, VA, 1970-1971 (1 year)	80	92
b. RADIATION PROTECTION	1) Reference 1 above 2) Reference 3 above	140 80	60 120
c. MATHEMATICS IN THE USE AND MEASUREMENT OF RADIOACTIVITY	1) Reference 1 above 2) Reference 3 above	125 60	
d. RADIATION BIOLOGY	1) Reference 1 above 2) Reference 3 above	40 40	
e. RADIOPHARMACEUTICAL CHEMISTRY	1) Reference 1 above 2) Reference 3 above	200	60 20

5. EXPERIENCE WITH RADIATION. (Actual use of Radioisotopes or Equivalent Experience)				
ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE GAINED	DURATION OF EXPERIENCE	TYPE OF USE
SM-1 Nuclear Power Reactor	1000 KW	SM-1, Ft. Belvoir, VA	1971 (1 year)	Health Physics Surveys; Reactor operations; Calibration

5. EXPERIENCE WITH RADIATION.(Actual use of Radioisotopes or Equivalent Experience)				
ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE GAINED	DURATION OF EXPERIENCE	TYPE OF USE
<sup>235</sup> U <sup>238</sup> U <sup>239</sup> Pu Pu-Be <sup>241</sup> Am <sup>137</sup> Cs <sup>3</sup> H	216 gm unsealed & soln. sources 3 gm unsealed source 43 gm, liquid sources 3 Ci, Sealed 600 mCi, Sealed 120 Ci, Sealed 110 Ci, Sealed	U.S. Army Environmental Hygiene Agency Aberdeen Proving Ground, MD  NRC Byproduct Material License	1973-1974 (1 year)	Health Physics Surveys; Alternate RSO; Calibration
Atomic No. 3-83 <sup>3</sup> H <sup>131</sup> I <sup>125</sup> I <sup>13</sup> C	5 mCi each 10 mCi, liquid 10 mCi, liquid 1 Ci, liquid 1 Ci, liquid	US Army Medical Lab Ft. Sam Houston, TX Radiation Safety Officer NRC Byproduct Material License (Medical)	1974-1975 (1 year)	RSO, RIA kits, Iodinations, Health Physics Surveys; Wet Chemistry procedures
<sup>99</sup> Mo/ <sup>99m</sup> Tc Generator	2 Ci	North Carolina Memorial Hospital Chapel Hill, NC	1982 (1 month)	Clinical Training
Atomic No. 3-83 10 CFR 35 Gp I-II Gp III Gp IV-V <sup>133</sup> Xe <sup>137</sup> Cs <sup>153</sup> Gd	25 mCi each  As needed 3 Ci each As needed 40 mCi 131 Ci 2 Ci	Dwight D. Eisenhower Army Medical Center, Fort Gordon, GA  Radiation Safety Officer for Hybrid Broad Scope NRC Materials License (Medical) USNRC No. 10-12044-03	May 1983-June 1989 (6 years)	RSO, Radiation Safety Surveys, Medical Physics Surveys, Calibration
Atomic No. 3-83  <sup>14</sup> C, <sup>3</sup> H, <sup>99</sup> Mo, <sup>99m</sup> Tc  <sup>32</sup> P, <sup>125</sup> I  <sup>137</sup> Cs	15 Ci total, ≤ 200 mCi each  5 Ci each, any form  1 Ci each, any form 4200 Ci, sealed source	Uniformed Services University of the Health Sciences, Bethesda, MD  Radiation Safety Officer for Broad Scope Type A NRC Material License (Medical) USNRC No. 19-23344-01	May 1989-June 1992 (3 years)	RSO, Health Physics Surveys, Calibration

5. EXPERIENCE WITH RADIATION.(Actual use of Radioisotopes or Equivalent Experience)				
ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE GAINED	DURATION OF EXPERIENCE	TYPE OF USE
<sup>235</sup> U	216 gm unsealed & soln. sources	U.S. Army Environmental Hygiene Agency Aberdeen Proving Ground, MD	June 1992 - May 1994 (2 years)	Health Physics Surveys; Principle User, Member of the Radiation Control Committee
<sup>238</sup> U	3 gm unsealed source			
<sup>239</sup> Pu	43 gm, liquid sources	NRC Byproduct Material License		
Pu-Be	3 Ci, Sealed			
<sup>241</sup> Am	600 mCi, Sealed			
<sup>137</sup> Cs	120 Ci, Sealed			
<sup>3</sup> H	110 Ci, Sealed			

## CURRICULUM VITAE

LTC WILLIAM B. JOHNSON, Ph.D, Medical Service Corps, US Army

**Address:**

**Residence:**

[ ]

**Work:**

Walter Reed Army Medical Center  
Chief, Health Physics Office  
Washington D.C. 20307-5001  
Phone: (301) 427-5104

**ACADEMIC AREAS OF INTEREST:**

Health Physics, Medical Physics, Optimizing Medical Images, Quality Control in Radiology, Computers, Public Health

**EDUCATION AND TRAINING:**

CIVILIAN TRAINING:

University of North Carolina, Chapel Hill, NC, Ph.D., Radiological Hygiene, [ ]

Tulane School of Public Health and Tropical Medicine, New Orleans, LA, MPH, Environmental Health, 1976.

Iowa State University, Ames, IA, BS, Mathematics, [ ]

Medical X-Ray Protection Course, USPHS, Rockville, MD, 2 weeks, 1973.

Ionizing and Nonionizing Radiation in Medicine, University of Pennsylvania, Philadelphia, PA, 1 week, 1979.

Electronic Imaging in Medicine, University of Texas at San Antonio, TX, 1 week, 1983.

Health Physics Aspects of Nuclear Attack, Health Physics Summer School, Louisiana University, Hammond, LA, 1 week, 1984.

Health Physics In Radiation Accidents, Oak Ridge Associated Universities, Oak Ridge, TN, 1 week, 1985.

MRI Acceptance Testing and Quality Control, The Bowman Gray School of Medicine, Winston-Salem, NC, 1 week, 1988.

International Society for Optical Engineering Medical Imaging V Meeting, San Jose, CA, 1 week, 1991.

American College of Radiology's Mammographic Image Quality Course: Role of the Medical Physicist, January 1993, 18 CME

26

credits awarded.

MILITARY TRAINING:

Nuclear Power Plant Operator Course (Health Physics Specialty), Ft. Belvoir, VA, 1 year, 1971.

AMEDD (MSC) Officer Basic Course, Ft. Sam Houston, TX, 9 weeks, 1972

AMEDD Officer Advanced Course, Ft. Sam Houston, TX, 24 weeks, 1975.

Command and General Staff Officer Course (Correspondence Option), 1 year, 1987.

Faculty Development Course, Academy of Health Sciences, Ft. Sam Houston, TX, 4 weeks, 1976.

Medical Effects of Nuclear Weapons, Armed Forces Radiobiology Research Institute, Bethesda, MD, 1 week, 1983.

Medical Physics and Military Medicine, US Army Environmental Hygiene Agency, Aberdeen Proving Ground, MD, 1 week, 1983, 1985, 1987, 1988, 1989, 1991, 1993.

TEACHING EXPERIENCE:

1990-1993, Assistant Professor of Preventive Medicine and Biometrics, Uniformed Services University of the Health Sciences, Bethesda, MD.

1977-1979, Instructor, Radiological Physics, Academy of Health Sciences, Ft. Sam Houston, TX.

1977-1979, Assistant Professor of Health Sciences, Baylor University at San Antonio, San Antonio, TX.

1969-1970, High School Teacher (Mathematics), Grant Community High School, Fox Lake, IL.

PROFESSIONAL EXPERIENCE:

1. June 1992 to May 1994, Chief, Health Physics Division, U.S. Army Environmental Hygiene Agency, Aberdeen Proving Ground, MD.

Duties: Leads and manages the Health Physics Division composed of the Medical Health Physics Branch, the Industrial Health Physics Branch and an Administrative Section. Directs the activities of some 25 professional health physicists in world wide mission of support of U.S. Army Radiation Protection Programs. Support

includes complete radiation protection program evaluations for compliance with Federal, Army, and Nuclear Regulatory Commission (NRC) Licenses for Medical and Industrial facilities, medical and industrial x-ray surveys, radiation dose assessments from bioassay data, assistance in preparation of documents to terminate NRC licenses, and conducting verification surveys for NRC License termination. Radiation protection policies are developed for the Army Surgeon General for implementation Army wide. Act as principle user of radioactive materials, supervisor of <sup>137</sup>Cs irradiator for calibration, and member of the Radiation Control Committee.

2. June 1989 to June 1992, Deputy Director, Environmental Health and Occupational Safety; Chief, Radiation Safety and Radiation Protection Officer, Uniformed Service University of the Health Sciences (USUHS), Bethesda, MD.

Duties: Responsible for the supervision and management of broad scope US Nuclear Regulatory Byproduct Materials License No. 19-23344-01. Supervises health physics personnel in the performance of laboratory radiation protection surveys, personnel dosimetry program, laboratory analysis, and radioactive material control. Provides technical advice to some 350 radiation workers working in about 150 radioisotope laboratories. Teaches in various graduate level courses in Preventive Medicine and Radiology. Provides technical consultation to Director and other Branch Chiefs. Acts as the Director when the Director is absent. Has been designated the Medical Physics Consultant on acquisition and acceptance testing of Computerized Tomography (CT) Systems and Magnetic Resonance Imaging (MRI) Systems for the Army Surgeon General. This CT and MRI mission is world wide.

3. June 1983-June 1989, Chief, Health Physics, Dwight D. Eisenhower Army Medical Center, Ft. Gordon, GA.

Duties: Served as Chief, Health Physics, and Radiation Protection Officer. Responsible for supervision and management of broad scope radiation protection program including management of US Nuclear Regulatory Byproduct Materials License No. 10-12044-03 and Department of Army Radioactive Materials Authorization No. 10-07-81. Served as Regional Consultant to DOD Health Region 10, which includes 9 Army Community Hospitals, and clinics in Panama and Puerto Rico. Performs Technical Surveys of radioactive materials and radiation producing devices to evaluate health hazards and performs medical physics evaluations to optimize imaging. Provides education support to professional staff. Supervises the personnel dosimetry program and performs dosimetry analysis of both radiation workers and patients. Is the Medical Physics Consultant on acquisition and acceptance testing of Computerized Tomography (CT) Systems and Magnetic Resonance Imaging (MRI) Systems for the Army Surgeon General. This CT and MRI mission is world wide.

4. September 1976 - June 1980, Chief, X-Ray Branch, Academy of Health Sciences, Ft. Sam Houston, TX.

Duties: Programs, plans and supervises overall operation of branch, including performance of 36 instructors and about 430 students annually. Branch is responsible for teaching the x-ray technologist program (radiographic) for the US Army. Also coordinates, plans, and supervises clinical training. Serves as Chairman of X-Ray Specialist Curriculum Committee, and Chairman of Medicine and Surgery Division Physics and Biophysics Committee. Serves as subject matter expert in radiology for Combat Development and Health Care Systems.

5. January 1975 - July 1975, Chief, Health Physics Branch, US Army Environmental Hygiene Agency Regional Activity South, Ft. Sam Houston, TX.

Duties: Conducts radiation protection surveys of US Army installations containing or generating ionizing radiation. Geographical area of support is all states west of the Mississippi River. Also reviews NRC license and DA Authorization applications. Performs technical consultation on radiation safety hazards.

6. March 1974 - December 1974, Chief, Department of Nuclear Medical Sciences, US Army Medical Laboratory, Ft. Sam Houston, TX.

Duties: Supervises laboratory procedures and techniques of radiation biology, radiochemistry, and biophysics for regional reference laboratory. Geographic area of support includes United States, Pacific Region, Korea, and Panama. Supervises radiation detection measurements, preparation and analysis of radioisotopes in support of diagnostic and other clinical procedures. Provides support on environmental surveillance. Advises on radiological hygiene matters to prevent unnecessary exposure of personnel to ionizing radiation. Performs duty of Chairman, Radioisotope Committee, and Radiological Protection Officer. Manages all aspects of AEC License No. 42-06316-01, and Department of Army Authorization for Radioactive Materials. Performs Health Physics surveys and overall monitoring of all Laboratory Departments engaged in work involving radioactive material.

7. January 1973 - February 1974, Survey Officer, Health Physics Division, US Army Environmental Hygiene Agency, Aberdeen Proving Ground, MD.

Duties: Reviews AEC license and Department of Army Authorizations applications as well as drafts Army directives and technical publications pertaining to radiological health; evaluates proposed in-system items containing or generating ionizing radiation; makes on-site surveys of Army diagnostic, industrial, and therapeutic x-ray facilities, radioactive sources, accelerators, human use of

radioisotopes and other sources of ionizing radiation; prepares reports with recommendations for corrective action; assists in training activities. Performs as Alternate Radiological Protection Officer. This requires preparation and maintenance of records and reports on receipt, issue, use, inventory, storage, and disposal of radioactive materials. Performs health physics surveys of all agency divisions engaged in working with radioactive materials.

8. September 1972 - October 1972, Health Physics Technician, SM1 Nuclear Power Plant, Ft. Belvoir, VA.

Duties: Conducts radiological surveys, performs treatment to maintain proper process fluid conditions of nuclear power plant. Operates nuclear power plant controls and equipment. Assists in refueling operations and preparing spent fuel elements and demineralizers for storage and shipment. Monitors process fluids for radioactivity and performs chemical separations. Conducts radiological surveys of nuclear power plant personnel, equipment, work areas and reactor elements.

#### **MEMBERSHIPS, PAPERS, PRESENTATIONS AND AWARDS:**

Member, Health Physics Society (1973)

Member, Eta Chapter, Delta Omega Society (1977)

"The Final Step in Decommissioning of the SM-1A Nuclear Power Plant: A Closeout Survey," AEHA Report No. 43-001-74, Health Physics National Meeting, 1974.

"A Data Base Management System For Real-Time Monitoring of Operating Parameters of A Diagnostic X-Ray System," Ph.D. Dissertation, University of North Carolina, Chapel Hill, NC, 1983.

"Computerized Quality Assurance in Diagnostic Radiology," Health Physics National Meeting, Baltimore, MD, 1983.

"Acceptance Testing of Computerized Tomography Systems," Savannah River Chapter Health Physics Society Meeting, September 1985.

"Operational Problems for a Radiation Protection Program at A Major Medical Institution," Medical Physics in Military Medicine Course, AEHA, MD, September 1987.

"A Protocol to Comply With The Joint Commission of Accreditation of Health Care Organizations Requirements in Diagnostic Radiology," Medical Physics In Military Medicine Course, AEHA, MD, October 1988.

CORRECTED COPY

MATERIALS LICENSE

Amendment No. 23

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		In accordance with the letter dated May 13, 1994, 3. License number 08-01738-03 is amended in its entirety to read as follows:	
1. Department of the Army Walter Reed Army Medical Center			
2. Washington, D.C. 20307-5001		4. Expiration date November 30, 1996	
		5. Docket or Reference No. 030-06895	
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. Cobalt 60	A. Sealed sources	A. Not to exceed 3500 curies per source and 70,000 curies total	
B. Cesium 137	B. Sealed sources	B. Not to exceed 2,100 curies per source and 8,400 curies total	
C. Cesium 137	C. Sealed sources	C. Not to exceed per source and total	
9. Authorized use			
A. In AECL Gammacell Model 220 Irradiator(s) for the irradiation of material except explosives, flammables, or corrosives.			
B. In AECL Gammacell Model 40 Irradiator(s) for the irradiation of material except explosives, flammables, or corrosives.			
C. In _____ Irradiator(s) for the irradiation of material except explosives, flammables, or corrosives.			

CONDITIONS

- 10. Licensed material may be used only at the licensee's facilities located at Walter Reed Army Medical Center, Washington, D.C.
- 11. A. Licensed material shall only be used by, or under the supervision of, individuals who have received the training described in application dated March 18, 1991 and have been designated in writing by the Radiation Safety Officer.
- B. The Radiation Safety Officer for this license is LTC William B. Johnson.
- 12. Sealed sources or detector cells containing licensed material shall not be opened or sources removed from source holders by the licensee.

Information in this record was derived in accordance with the Freedom of Information Act, exemptions 2  
2006-0238

EX-2 COPY  
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MATERIALS LICENSE  
SUPPLEMENTARY SHEET

License number

08-01738-03

Docket or Reference number

030-06895

CORRECTED COPY

Amendment No. 23

13. 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.
- 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 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.

MATERIALS LICENSE  
SUPPLEMENTARY SHEET

License number

08-01738-03

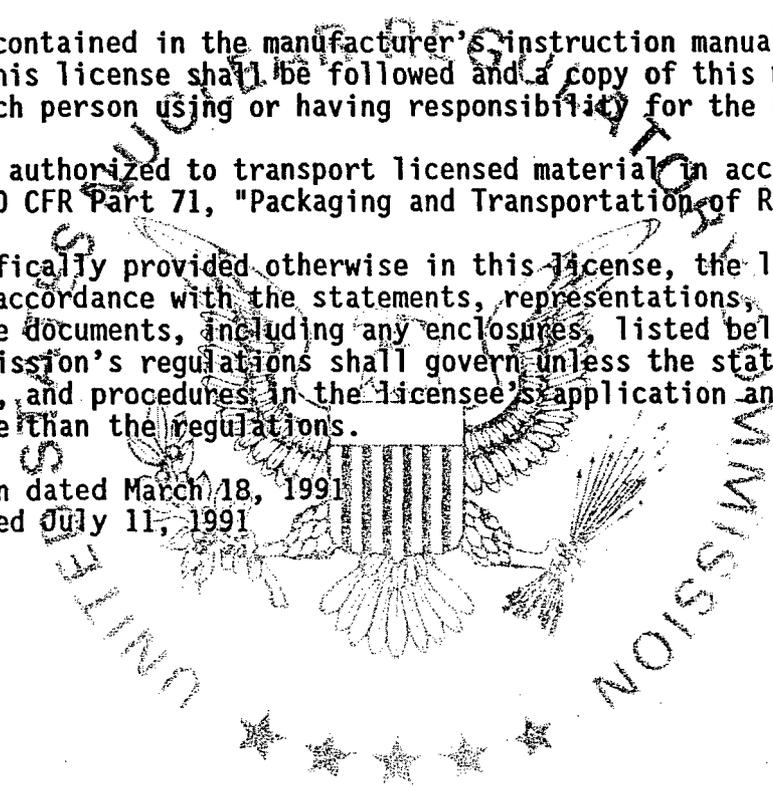
Docket or Reference number

030-06895

Amendment No. 23

CORRECTED COPY

- 14. 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 Commission or an Agreement State to perform such services.
- 15. The licensee shall conduct a physical inventory every six months to account for all sealed sources and devices containing licensed material received and possessed under the license.
- 16. 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.
- 17. The licensee is authorized to transport licensed material in accordance with the provisions of 10 CFR Part 71, "Packaging and Transportation of Radioactive Material."
- 18. 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 March 18, 1991
  - B. Letter dated July 11, 1991



For the U.S. Nuclear Regulatory Commission

Original Signed By:  
Duncan White

By

Nuclear Materials Safety Branch  
Region I  
King of Prussia, Pennsylvania 19406

Date JUN 30 1995

JUN 30 1995

LTC William B. Johnson  
Radiation Safety Officer  
Department of the Army  
Walter Reed Army Medical Center  
Washington, D. C. 20307-5001

Dear LTC Johnson:

Enclosed is the Corrected Copy of Amendment No. 23 for License No. 08-01738-03. In accordance with the information you provided our inspector during the recent inspection of your licensed program, License Condition 6.A. has been changed from Cesium 137 to Cobalt 60.

We apologize for any inconvenience this error may have caused.

Sincerely,

Original Signed By:  
Duncan White  
Walter J. Pasciak, Chief  
Industrial Applications Section  
Division of Radiation Safety  
and Safeguards

Docket No. 030-06895  
License No. 08-01738-03  
Control No. 119857

cc:  
District of Columbia

Enclosure:  
Corrected Copy of Amendment No. 23

DOCUMENT NAME: R:\WPS\MLTR\L0801738.03

OFFICE	DRSS/RI <i>WJ</i>	DRSS/RI <i>WJ</i>	DRSS/RI	DRSS/RI
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DATE	06/30/95	06/30/95	06/ /95	06/ /95

OFFICIAL RECORD COPY

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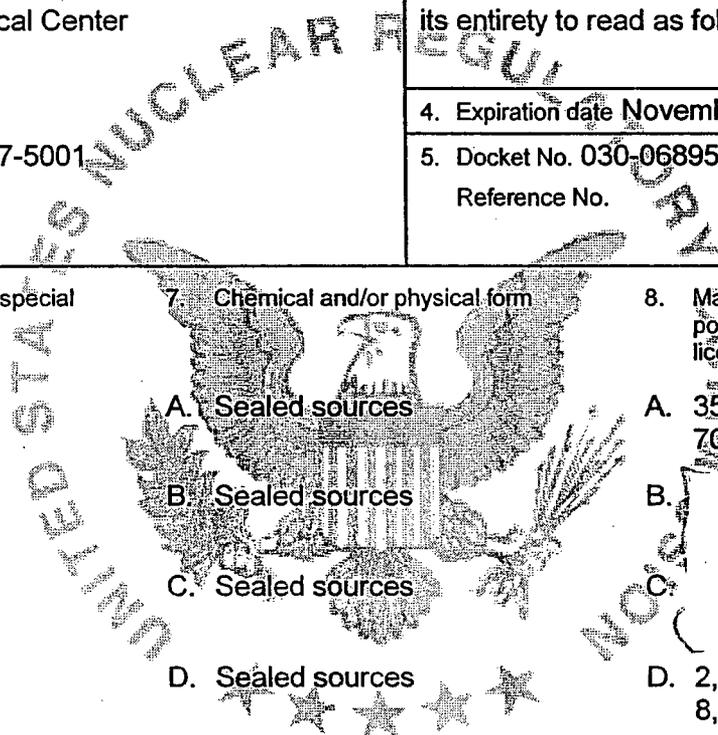
MATERIALS LICENSE

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.

<p>Licensee</p> <p>1. Department of the Army Walter Reed Army Medical Center</p> <p>2. Washington, D.C. 20307-5001</p>	<p>In accordance with letter dated October 15, 1998,</p> <p>3. License number 08-01738-03 is amended in its entirety to read as follows:</p> <p>4. Expiration date November 30, 2001</p> <p>5. Docket No. 030-06895 Reference No.</p>
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<p>6. Byproduct, source, and/or special nuclear material</p> <p>A. Cobalt 60</p> <p>B. Cobalt 60</p> <p>C. Cesium 137</p> <p>D. Cesium 137</p> <p>E. Cesium 137</p>	<p>7. Chemical and/or physical form</p> <p>A. Sealed sources</p> <p>B. Sealed sources</p> <p>C. Sealed sources</p> <p>D. Sealed sources</p> <p>E. Sealed sources</p>	<p>8. Maximum amount that licensee may possess at any one time under this license</p> <p>A. 3500 curies per source and 70,000 curies total</p> <p>B. [ ] per source and total</p> <p>C. [ ] per source and total</p> <p>D. 2,100 curies per source and 8,400 curies total</p> <p>E. [ ] per source and total</p>
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<p>9. Authorized use:</p> <p>A. In AECL Gammacell Model 220 Irradiators for the irradiation of material except explosives, flammables, or corrosives.</p> <p>B. In [ ] Series Irradiators for the irradiation of material except explosives, flammables or corrosives.</p> <p>C. In [ ] Irradiators for the irradiation of material except explosives, flammables or corrosives.</p> <p>D. In AECL Gammacell Model 40 Irradiators for the irradiation of material except explosives, flammables, or corrosives.</p> <p>E. In [ ] Irradiators for the irradiation of material except explosives, flammables, or corrosives.</p>
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Information in this record was deleted in accordance with the Freedom of Information Act exemptions 2

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**MATERIALS LICENSE  
SUPPLEMENTARY SHEET**License Number  
08-01738-03Docket or Reference Number  
030-06895

Amendment No. 24

**CONDITIONS**

10. Licensed material may be used only at the licensee's facilities located at Walter Reed Army Medical Center, Washington, D.C.
11. A. Licensed material shall only be used by, or under the supervision of, individuals who have received the training described in application dated March 18, 1991 and have been designated in writing by the Radiation Safety Officer.
- B. The Radiation Safety Officer for this license is LTC William B. Johnson.
12. Sealed sources or detector cells containing licensed material shall not be opened or sources removed from source holders by the licensee.
13. 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.
- 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.

**MATERIALS LICENSE  
SUPPLEMENTARY SHEET**License Number  
08-01738-03Docket or Reference Number  
030-06895

Amendment No. 24

- 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 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.
14. 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 Commission or an Agreement State to perform such services.
15. The licensee shall conduct a physical inventory every six months to account for all sealed sources and devices containing licensed material received and possessed under the license.
16. 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.
17. The licensee is authorized to transport licensed material in accordance with the provisions of 10 CFR Part 71, "Packaging and Transportation of Radioactive Material."

**MATERIALS LICENSE  
SUPPLEMENTARY SHEET**

License Number  
08-01738-03

Docket or Reference Number  
030-06895

Amendment No. 24

18. 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 March 18, 1991
- B. Letter dated July 11, 1991
- C. Letter dated October 15, 1998



For the U.S. Nuclear Regulatory Commission

Date November 12, 1998

By

*Original signed by Sheri Minnick*

\_\_\_\_\_  
 Sheri Minnick  
 Nuclear Materials Safety Branch 2  
 Division of Nuclear Materials Safety  
 Region I  
 King of Prussia, Pennsylvania 19406

November 12, 1998

Docket No. 030-06895  
Control No. 126198

License No. 08-01738-03

Colonel William B. Johnson  
Radiation Safety Officer  
Department of the Army  
Walter Reed Army Medical Center  
Washington, DC 20307-5001

Dear COL. Johnson:

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. Your new expiration date is stated in Item 4 of the license.

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 Sheri Minnick***

Sheri Minnick  
Health Physicist  
Nuclear Materials Safety Branch 2  
Division of Nuclear Materials Safety

Enclosures:

1. 10 CFR Part 30
2. Amendment No. 24

ML10

W. Johnson  
Department of the Army

2

DOCUMENT NAME: G:\DNMS\DOCWORK\LICLTRL0801738.03

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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	<input checked="" type="checkbox"/> N	DNMS/RI	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
NAME	SMinnick <i>SM</i>						
DATE	11/12/98		11/ /98		11/ /98		11/ /98

OFFICIAL RECORD COPY

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

10-15-98, and to inform you that the initial processing which includes an administrative review has been performed. 08-01738-03

There were no administrative omissions. <sup>*Amend.*</sup> 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

---

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 **126198**  
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



DEPARTMENT OF THE ARMY  
WALTER REED ARMY MEDICAL CENTER  
WALTER REED HEALTH CARE SYSTEM  
WASHINGTON, DC 20307-5001

030-06895

REPLY TO  
ATTENTION OF

October 15, 1998

Preventive Medicine Services

SUBJECT: NRC Materials License 08-01738-03 Amendment Request to Add 2 Irradiators

Nuclear Regulatory Commission, Region I  
Medical Licensing Division  
475 Alendale Road  
King of Prussia, Pennsylvania 19406-1415

Medical Licensing Division:

Walter Reed Army Medical Center (WRAMC), Washington, DC, uses byproduct material authorized by U.S. Nuclear Regulatory Commission (NRC) license number 08-01738-03 with an expiration date of November 30, 2001.

Request that paragraphs 6-9 of NRC License 08-01738-03 be amended to add a model cobolt-60 irradiator Registry of Radioactive Sealed Sources and Devices (SS&D) Number [redacted] The source model designation is [redacted] SS&D Number is [redacted] with a maximum loading of [redacted] of cobolt-60. Request to increase the license sealed source limit by [redacted] of cobolt-60 for this irradiator.

Request that paragraphs 6-9 of NRC License 08-01738-03 be amended to add a model irradiator Registry of Radioactive Sealed Sources and Devices (SS&D) Number [redacted] The source model designation is [redacted] SS&D Number is [redacted] with a maximum loading [redacted] of cesium-137. Request to increase the license sealed source limit by [redacted] of cesium-137 for this irradiator.

This licensee will conduct its radiation safety program in accordance with that statements, representations and procedures contained in Amendment 23, NRC License 08-01738-03, documents accompanying the license renewal application dated March 18, 1991 and letter dated July 11, 1991.

Request to amend Item #10.1 on the renewal application dated 18 March 1991 to read:

“All personnel using the irradiators will be monitored by electronic area monitoring and alarming devices. Records will be maintained in the Health Physics Office documenting that any individuals using the irradiator(s) are not likely to receive, in one year, a radiation dose in excess of 10% of the allowable limits in 10 CFR Part 20.”

Ex 2

OFFICIAL RECORD COPY

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126108  
OCT 21 1998

For additional information regarding this correspondence, please contact Colonel William B. Johnson, Chief, Health Physics Office, Preventive Medicine Services, at (202) 356-0058.

Sincerely,



William B. Johnson  
Colonel, U.S. Army  
Radiation Safety Officer, Walter Reed Army  
Medical Center

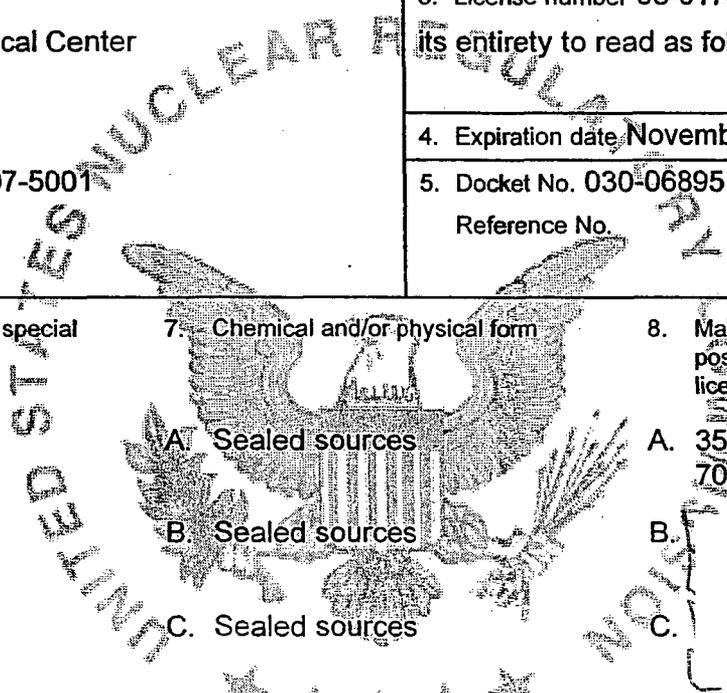
Copy Furnished:

U.S. Army Medical Command, ATTN: MCHO-CL-W/COL Daxon, 2050 Worth Road, Fort Sam  
Houston, TX 78234-6000

### MATERIALS LICENSE

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.

<p>Licensee</p> <p>1. Department of the Army Walter Reed Army Medical Center</p> <p>2. Washington, D.C. 20307-5001</p>	<p>In accordance with letter dated January 4, 1999,</p> <p>3. License number 08-01738-03 is amended in its entirety to read as follows:</p> <p>4. Expiration date November 30, 2001</p> <p>5. Docket No. 030-06895 Reference No.</p>
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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. Cobalt 60	A. Sealed sources	A. 3500 curies per source and 70,000 curies total
B. Cobalt 60	B. Sealed sources	B. per source and total
C. Cesium 137	C. Sealed sources	C. per source and total
D. Cesium 137	D. Sealed sources	D. 2,100 curies per source and 8,400 curies total
E. Cesium 137	E. Sealed sources	E. per source and total

9. Authorized use:

A. In AECL Gammacell Model 220 Irradiators for the irradiation of material except explosives, flammables, or corrosives.

B. In Irradiators for the irradiation of material except explosives, flammables or corrosives.

C. In Irradiators for the irradiation of material except explosives, flammables or corrosives.

D. In AECL Gammacell Model 40 Irradiators for the irradiation of material except explosives, flammables, or corrosives.

E. In Irradiators for the irradiation of material except explosives,

Information in this record was deleted in accordance with the Freedom of Information Act exemptions 2  
2006-0238

EX 2

JJ 11

**MATERIALS LICENSE  
SUPPLEMENTARY SHEET**License Number  
08-01738-03Docket or Reference Number  
030-06895

Amendment No. 25

flammables, or corrosives.

**CONDITIONS**

10. Licensed material may be used only at the licensee's facilities located at Walter Reed Army Medical Center, Washington, D.C. and Walter Reed Army Medical Center, Forest Glen Section and Annex, Silver Spring, Maryland.
11. A. Licensed material shall only be used by, or under the supervision of, individuals who have received the training described in application dated March 18, 1991 and have been designated in writing by the Radiation Safety Officer.
- B. The Radiation Safety Officer for this license is COL William B. Johnson.
12. Sealed sources or detector cells containing licensed material shall not be opened or sources removed from source holders by the licensee.
13. 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.
- 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

**MATERIALS LICENSE  
SUPPLEMENTARY SHEET**License Number  
08-01738-03Docket or Reference Number  
030-06895

Amendment No. 25

- (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 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.
14. 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 Commission or an Agreement State to perform such services.
15. The licensee shall conduct a physical inventory every six months to account for all sealed sources and devices containing licensed material received and possessed under the license.
16. 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.
17. The licensee is authorized to transport licensed material in accordance with the provisions of 10 CFR Part 71, "Packaging and Transportation of Radioactive Material."

**MATERIALS LICENSE  
SUPPLEMENTARY SHEET**License Number  
08-01738-03Docket or Reference Number  
030-06895

Amendment No. 25

18. 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 March 18, 1991
- B. Letter dated July 11, 1991
- C. Letter dated October 15, 1998
- D. Letter dated February 16, 1999



For the U.S. Nuclear Regulatory Commission

Date February 23, 1999

By

*Original signed by Eric H. Reber*

Eric H. Reber  
Nuclear Materials Safety Branch 2  
Division of Nuclear Materials Safety  
Region I  
King of Prussia, Pennsylvania 19406

February 23, 1999

Docket No. 030-06895  
Control No. 126424

License No. 08-01738-03

William B. Johnson  
Radiation Safety Officer  
Department of the Army  
Walter Reed Army Medical Center  
Washington, DC 20307-5001

Dear Col. Johnson:

This refers to your license amendment request. Enclosed with this letter is the amended license. This Amendment adds the new facility as requested to enable you to move your licensed activities. Prior to release of your current facility for unrestricted use, you must receive an Amendment removing your current facility from your license. Include in the request, the results of surveys demonstrating that the levels of residual activity in the facility are acceptable. When you submit the Amendment request please refer to the Control Number at the top of this letter.

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 Eric H. Reber***

Eric H. Reber  
Health Physicist  
Nuclear Materials Safety Branch 2  
Division of Nuclear Materials Safety

Enclosures:

1. Amendment No. 25
2. Guidelines for Decontamination of Facilities and Equipment

cc:Colonel Daxon, MCHO-CL-W

ML10

DOCUMENT NAME: B:\DNMS Documents\Lic Cover Letter\L08-01738-03.a.wpd 80743556

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	EReber 						
DATE	02/23/99		02/ /99		02/ /99		02/ /99

OFFICIAL RECORD COPY



DEPARTMENT OF THE ARMY  
WALTER REED ARMY MEDICAL CENTER  
WALTER REED HEALTH CARE SYSTEM  
WASHINGTON, DC 20307-5001

REPLY TO  
ATTENTION OF

February 16, 1999

MS16

L-3

Health Physics Office

SUBJECT: Additional Information to Support NRC Materials License 0801738-03  
Amendment Request to Add Use Location

U.S. Nuclear Regulatory Commission, Region I  
Division of Nuclear Materials Safety  
Attention: Mr. Eric Reber  
475 Allendale Road  
King of Prussia, Pennsylvania 19406-1415

Dear Mr. Reber:

This letter provides the additional information you requested in the review of the above NRC Irradiator License, reference Mail Control Number 126424. We request that paragraph 10 be amended to add WRAMC Forest Glen Section and Annex, Silver Spring, MD, in addition to the WRAMC, Washington, DC location.

Any of the self-shielded irradiators at the new location will meet the following conditions: The location of the self-shielded irradiator will correspond to the 'Conditions of Normal Use' and 'Limitations and/or Other Considerations of Use' on the applicable irradiator's Sealed Source and Device Registration Certificate; the floor beneath the self-shielded irradiator is adequate to support the weight of the irradiator; each self-shielded irradiator is secured to prevent unauthorized access or removal; and each area where a self-shielded irradiator is located is equipped with an automatically operated fire detection and control system (sprinkler, chemical, or gas) or the location of the area and other controls ensure a low-level radiation risk attributable to fires.

For additional information regarding this request, please contact Colonel William B. Johnson, Chief, Health Physics Office, Preventive Medicine Services, Walter Reed Army Medical Center, Washington, D.C., at (202) 3546-0058.

Sincerely,

  
William B. Johnson  
Colonel, U.S. Army  
Radiation Safety Officer, Walter Reed  
Army Medical Center



MS15  
L-3

\*\*\*\*Facsimile Transmittal\*\*\*\*  
February 10, 1999

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Message For: William B. Johnson  
Of: Army - Walter Reed  
Fax #: 202-356-0086  
Voice #: 202-356-0058

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Number of Pages (including this cover sheet): 4

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From: Eric Reber  
Division of Nuclear Materials Safety  
United States Nuclear Regulatory Commission  
Region I  
475 Allendale Road  
King of Prussia, PA 19406

Voice #: (610) 337-5276  
Fax #s: (610) 337-5269 or (610) 337-5393  
Internet Address: EHR@NRC.GOV

---

Message: Please provide the information in Section 8.9, NUREG-1556, Vol. 5 regarding your new facility at WRAMC Forest Glen Section and Annex, Silver Spring, Maryland

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ML 10

126424

## CONTENTS OF AN APPLICATION

**Discussion:** Licensees need to perform a prospective evaluation to determine radiation doses likely to be received by different individuals or groups. AUs, individuals performing routine maintenance, and individuals performing installations, relocations, non-routine maintenance, or repairs would be most likely to receive doses in excess of 1 mSv (100 mrem) in a year. See the previous section for a discussion of training and experience for AUs.

Individuals, other than AUs (e.g., biomedical engineers), may perform routine maintenance on irradiators. However, they must be trained in radiation safety and in the irradiator manufacturers' operating procedures, or they must work under the supervision and in the direct physical presence of someone who has this training.

Some licensees may have specific individuals trained to perform installations, relocations, non-routine maintenance, or repairs. Authorizations for these functions are separate from those for an AU or an individual who performs routine maintenance and will be specifically stated in a license condition. Appendix I contains suggested training for individuals who will conduct non-routine maintenance.

While performing prospective evaluations, a licensee may recognize that some individuals (e.g., housekeeping staff), although not likely to receive doses over 1 mSv (100 mrem), should receive training to ensure adequate security and control of licensed material. Licensees may provide these individuals with training commensurate with their involvement with licensed material. For example, housekeeping staff may receive training on the nature and location of the irradiator and the meaning of the radiation symbol, and instructions not to touch the irradiator and to remain out of the room if the irradiator door is open.

**Response from Applicant:** The applicant's training program will be examined during inspections, but should not be submitted in the license application.

## 8.9 ITEM 9: FACILITIES AND EQUIPMENT

**Regulations:** 10 CFR 30.33(a)(2).

**Criteria:** Facilities and equipment must be adequate to protect health and minimize danger to life or property.

**Discussion:** Self-shielded irradiators incorporate many engineering features to protect individuals from unnecessary radiation exposure. These devices are usually designed for use in a laboratory environment, i.e., inside a building, protected from the weather, and without wide variations of temperature and humidity. For information to help applicants determine the location of irradiators, see the sections on the SSD Registration Certificate entitled, "Conditions of Normal Use" and "Limitations and/or Other Considerations of Use."

For example, if a proposed location for a self-shielded irradiator is not within the conditions of normal use or the limitations of use, the applicant will need to provide adequate justification. In addition, the applicant will need to take compensatory measures (e.g., increased surveillance and maintenance) to ensure that the irradiator operates as designed and provides the intended level of protection. IN 96-35, "Failure of Safety Systems on Self-Shielded Irradiators Because of Inadequate Maintenance and Training," dated June 11, 1996, discusses an incident resulting from irradiator failure in which the lack of a climate-controlled environment (i.e., loading dock) may have accelerated the degradation of internal components leading to a failed interlock and excessive dose received by an irradiator operator.

Self-shielded irradiators vary in weight from several hundred to several thousand kilograms (pounds). Before installing an irradiator, licensees need to evaluate whether the floor in the proposed location can support the irradiator. Often licensees locate self-shielded irradiators on a ground floor. Some smaller and lighter irradiators require additional security measures to prevent unauthorized removal (e.g., locked in a room, bolted to the floor). For more information see "Radiation Safety Program - Operating and Emergency Procedures" and "Radiation Safety Program - Public Dose."

The fire-resistant properties of most irradiators should provide adequate radioactive material containment and shielding integrity in most situations; however, additional protection is desirable for some situations. For example, the room housing the irradiator should be equipped with an automatically-operated fire detection and control system (sprinkler, chemical, or gas). As an alternative, the self-shielded irradiator should be located under conditions (e.g., ground floor location in fire-resistant building with little combustible material) and other controls (e.g., coordination with and training of firefighting personnel) that ensure a low level of radiation risk attributable to fires.

**Response from Applicant:** Provide either of the following:

- The statement: "We will ensure that each area where a self-shielded irradiator is located corresponds to the 'Conditions of Normal Use' and 'Limitations and/or Other Considerations of Use' on the applicable irradiator's Sealed Source and Device Registration Certificate; the floor beneath the self-shielded irradiator is adequate to support the weight of the irradiator; each self-shielded irradiator is secured to prevent unauthorized access or removal; and each area where a self-shielded irradiator is located is equipped with an automatically operated fire detection and control system (sprinkler, chemical, or gas) or the location of the area and other controls ensure a low-level radiation risk attributable to fires."

**OR**

- Submit alternative information; be sure to include justification for placing an irradiator in an area that does not correspond to the "Conditions of Normal Use" and the "Limitations and/or Other Considerations of Use."

## CONTENTS OF AN APPLICATION

**Note:** Alternative information will be reviewed using the criteria listed above.

**References:** INs are available in the "Reference Library" on NRC's Home Page at <<http://www.nrc.gov>>. For hard copies, see the Notice of Availability (on the inside front cover of this report).

## 8.10 ITEM 10: RADIATION SAFETY PROGRAM

### 8.10.1 AUDIT PROGRAM

**Regulations:** 10 CFR 20.1101, 10 CFR 20.2102.

**Criteria:** Licensees must review the content and implementation of their radiation protection programs annually to ensure the following:

- Compliance with NRC and DOT regulations (as applicable), and the terms and conditions of the license;
- Occupational doses and doses to members of the public are as low as is reasonably achievable (ALARA) (10 CFR 20.1101); and
- Records of audits and other reviews of program content are maintained for 3 years.

**Discussion:** Appendix J contains a suggested audit program that is specific to the use of self-shielded irradiators and is acceptable to NRC. All areas indicated in Appendix J may not be applicable to every licensee and may not need to be addressed during each audit. For example, licensees do not need to address areas which do not apply to their activities, and activities which have not occurred since the last audit need not be reviewed at the next audit. Generally, audits are conducted at least once every 12 months.

Currently the NRC's emphasis in inspections is to perform actual observations of work in progress. As a part of their audit programs, applicants should consider performing unannounced audits of irradiator users to determine if, for example, Operating and Emergency Procedures are available and are being followed.

It is essential that once identified, problems be corrected comprehensively and in a timely manner; IN 96-28, "Suggested Guidance Relating to Development and Implementation of Corrective Action," dated May 1, 1996, provides guidance on this subject. The NRC will review the licensee's audit results and determine if corrective actions are thorough, timely, and sufficient to prevent recurrence. If violations are identified by the licensee and these steps are taken, the NRC can exercise discretion and may elect not to cite a violation. The NRC's goal is to encourage prompt identification and prompt, comprehensive correction of violations and

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

1-4-99, and to inform you that the initial processing which includes an administrative review has been performed. 08-01738-03

There were no <sup>Amend</sup> 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

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 1 2 6 4 2 4  
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 (R)  
(6-96)

Sincerely,  
Licensing Assistance Team Leader



DEPARTMENT OF THE ARMY  
WALTER REED ARMY MEDICAL CENTER  
WALTER REED HEALTH CARE SYSTEM  
WASHINGTON, DC 20307-5001

030-06895

REPLY TO  
ATTENTION OF

January 4, 1999

Preventive Medicine Services

SUBJECT: NRC Materials License 08-01738-03 Amendment Request to Add Use Location

Nuclear Regulatory Commission, Region I  
Medical Licensing Division  
475 Alendale Road  
King of Prussia, Pennsylvania 19406-1415

Medical Licensing Division:

Walter Reed Army Medical Center (WRAMC), Washington, DC, uses byproduct material authorized by U.S. Nuclear Regulatory Commission (NRC) license number 08-01738-03 with an expiration date of November 30, 2001.

The Walter Reed Army Institute of Research will begin relocating many of its research laboratories to a new facility at Forest Glen Annex in February 1999. We request that paragraph 10 be amended to add WRAMC Forest Glen Section and Annex, Silver Spring, Maryland as an authorized use location for the irradiators listed on this license. The irradiators cannot be shipped until this license amendment is approved, we therefore respectfully request that this action be expedited.

For additional information regarding this correspondence, please contact Colonel William B. Johnson, Chief, Health Physics Office, Preventive Medicine Services, at (202) 356-0058.

Sincerely,

William B. Johnson  
Colonel, U.S. Army  
Radiation Safety Officer, Walter Reed Army  
Medical Center

Copy Furnished:

U.S. Army Medical Command, ATTN: MCHO-CL-W/COL Daxon, 2050 Worth Road, Fort Sam  
Houston, TX 78234-6000

1 2 6 4 2 4

OFFICIAL RECORD COPY ML 10

JAN - 7 1999



DEPARTMENT OF THE ARMY  
 WALTER REED ARMY MEDICAL CENTER  
 WASHINGTON, DC 20307-5001



REPLY TO  
 ATTENTION OF:

HSHL-HP (385-11)

13 May 1994

MEMORANDUM THRU

Commander, U.S. Army Health Services Command, ATTN: HSCL-P, Fort  
~~Sam Houston, Texas 78234-6000~~

*MJM*  
 26 MAY 94

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

FOR U.S. Nuclear Regulatory Commission, Region I, Nuclear  
 Safety Section A, 475 Allendale Road, King of Prussia,  
 PA 19406

SUBJECT: Amendment of US Nuclear Regulatory Commission Licenses  
 No. 030-01317 and No. 030-06895

1. Request that NRC Licenses <sup>08-01738-02</sup> ~~030-01317~~ and <sup>08-01738-03</sup> ~~030-06895~~ be amended to reflect a change in the Radiation Safety Officer from CPT Mark A. Melanson to LTC William B. Johnson. LTC Johnson has been assigned as the Chief, Health Physics Office at Walter Reed Army Medical Center since 9 May 1994.
2. A Training and Experience Form and a Curriculum Vitae for LTC Johnson are attached (Enclosures 1 and 2).
3. POC for this matter is Mr. David W. Burton or LTC Johnson @ (301)-427-5104/5107.

FOR THE COMMANDER:

2 Encls

*Earl S. Newsome III*  
 EARL S. NEWSOME III  
 LTC, MS  
 Executive Officer

Information in this record was deleted  
 in accordance with the Freedom of Information  
 Act, exemptions 6  
 FOIA- 2006-0238

*AL0506080430*

*MJM/8*

## TRAINING AND EXPERIENCE

## AUTHORIZED USER OR RADIATION SAFETY OFFICER

1. NAME OF AUTHORIZED USER OR  
RADIATION SAFETY OFFICER

WILLIAM B. JOHNSON, Ph.D.

2. STATE OR TERRITORY IN  
WHICH LICENSED TO  
PRACTICE MEDICINE:  
NOT APPLICABLE

## 3. CERTIFICATION

SPECIALTY BOARD  
ACATEGORY  
BMONTH & YEAR CERTIFIED  
C

NOT APPLICABLE

NOT APPLICABLE

NOT APPLICABLE

## 4. TRAINING RECEIVED IN BASIC RADIOACTIVE HANDLING TECHNIQUES

FIELD OF TRAINING A	LOCATION AND DATE(S) OF TRAINING B	TYPE & LENGTH OF TRAINING	
		LECTURE/ LABORATORY COURSES (Hours) C	SUPERVISED LABORATORY EXPERIENCE (Hours) D
a. RADIATION PHYSICS AND INSTRUMENTATION	1) Univ of North Carolina, Chapel Hill, NC, 1980-1983 (3 years) 2) Tulane, New Orleans, LA, 1976 (1 year) 3) Ft. Belvoir, VA, 1970- 1971 (1 year)	80 60 168	92
b. RADIATION PROTECTION	1) Reference 1 above 2) Reference 3 above	140 80	60 120
c. MATHEMATICS IN THE USE AND MEASUREMENT OF RADIOACTIVITY	1) Reference 1 above 2) Reference 3 above	125 60	
d. RADIATION BIOLOGY	1) Reference 1 above 2) Reference 3 above	40 40	
e. RADIOPHARMACEUTICAL CHEMISTRY	1) Reference 1 above 2) Reference 3 above	200	60 20

## 5. EXPERIENCE WITH RADIATION. (Actual use of Radioisotopes or Equivalent Experience)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE GAINED	DURATION OF EXPERIENCE	TYPE OF USE
SM-1 Nuclear Power Reactor	1000 KW	SM-1, Ft. Belvoir, VA	1971 (1 year)	Health Physics Surveys; Reactor operations; Calibration

Training and Experience continued  
WILLIAM B. JOHNSON

5. EXPERIENCE WITH RADIATION.(Actual use of Radioisotopes or Equivalent Experience)				
ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE GAINED	DURATION OF EXPERIENCE	TYPE OF USE
<sup>235</sup> U <sup>238</sup> U <sup>239</sup> Pu Pu-Be <sup>241</sup> Am <sup>137</sup> Cs <sup>3</sup> H	216 gm unsealed & soln. sources 3 gm unsealed source 43 gm, liquid sources 3 Ci, Sealed 600 mCi, Sealed 120 Ci, Sealed 110 Ci, Sealed	U.S. Army Environmental Hygiene Agency Aberdeen Proving Ground, MD  NRC Byproduct Material License	1973-1974 (1 year)	Health Physics Surveys; Alternate RSO; Calibration
Atomic No. 3-83 <sup>3</sup> H <sup>131</sup> I <sup>125</sup> I <sup>13</sup> C	5 mCi each 10 mCi, liquid 10 mCi, liquid 1 Ci, liquid 1 Ci, liquid	US Army Medical Lab Ft. Sam Houston, TX Radiation Safety Officer NRC Byproduct Material License (Medical)	1974-1975 (1 year)	RSO, RIA kits, Iodinations, Health Physics Surveys; Wet Chemistry procedures
<sup>99</sup> Mo/ <sup>99m</sup> Tc Generator	2 Ci	North Carolina Memorial Hospital Chapel Hill, NC	1982 (1 month)	Clinical Training
Atomic No. 3-83 10 CFR 35 Gp I-II Gp III Gp IV-V <sup>133</sup> Xe <sup>137</sup> Cs <sup>153</sup> Gd	25 mCi each  As needed 3 Ci each As needed 40 mCi 131 Ci 2 Ci	Dwight D. Eisenhower Army Medical Center, Fort Gordon, GA  Radiation Safety Officer for Hybrid Broad Scope NRC Materials License (Medical) USNRC No. 10-12044-03	May 1983-June 1989 (6 years)	RSO, Radiation Safety Surveys, Medical Physics Surveys, Calibration
Atomic No. 3-83  <sup>14</sup> C, <sup>3</sup> H, <sup>99</sup> Mo, <sup>99m</sup> Tc  <sup>32</sup> P, <sup>125</sup> I  <sup>137</sup> Cs	15 Ci total, ≤ 200 mCi each  5 Ci each, any form  1 Ci each, any form 4200 Ci, sealed source	Uniformed Services University of the Health Sciences, Bethesda, MD  Radiation Safety Officer for Broad Scope Type A NRC Material License (Medical) USNRC No. 19-23344-01	May 1989-June 1992 (3 years)	RSO, Health Physics Surveys, Calibration

5. EXPERIENCE WITH RADIATION.(Actual use of Radioisotopes or Equivalent Experience)				
ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE GAINED	DURATION OF EXPERIENCE	TYPE OF USE
<sup>235</sup> U <sup>238</sup> U <sup>239</sup> Pu Pu-Be <sup>241</sup> Am <sup>137</sup> Cs <sup>3</sup> H	216 gm unsealed & soln. sources 3 gm unsealed source 43 gm, liquid sources 3 Ci, Sealed 600 mCi, Sealed 120 Ci, Sealed 110 Ci, Sealed	U.S. Army Environmental Hygiene Agency Aberdeen Proving Ground, MD  NRC Byproduct Material License	June 1992 - May 1994 (2 years)	Health Physics Surveys; Principle User, Member of the Radiation Control Committee

## CURRICULUM VITAE

LTC WILLIAM B. JOHNSON, Ph.D, Medical Service Corps, US Army

Address:

Residence:

Work:

Walter Reed Army Medical Center  
Chief, Health Physics Office  
Washington D.C. 20307-5001  
Phone: (301) 427-5104

### ACADEMIC AREAS OF INTEREST:

Health Physics, Medical Physics, Optimizing Medical Images, Quality Control in Radiology, Computers, Public Health

### EDUCATION AND TRAINING:

#### CIVILIAN TRAINING:

University of North Carolina, Chapel Hill, NC, Ph.D.,  
Radiological Hygiene, [ ]

Tulane School of Public Health and Tropical Medicine, New Orleans, LA, MPH, Environmental Health, 1976.

Iowa State University, Ames, IA, BS, Mathematics, [ ]

Medical X-Ray Protection Course, USPHS, Rockville, MD, 2 weeks, 1973.

Ionizing and Nonionizing Radiation in Medicine, University of Pennsylvania, Philadelphia, PA, 1 week, 1979.

Electronic Imaging in Medicine, University of Texas at San Antonio, TX, 1 week, 1983.

Health Physics Aspects of Nuclear Attack, Health Physics Summer School, Louisiana University, Hammond, LA, 1 week, 1984.

Health Physics In Radiation Accidents, Oak Ridge Associated Universities, Oak Ridge, TN, 1 week, 1985.

MRI Acceptance Testing and Quality Control, The Bowman Gray School of Medicine, Winston-Salem, NC, 1 week, 1988.

International Society for Optical Engineering Medical Imaging V Meeting, San Jose, CA, 1 week, 1991.

Ex 6

American College of Radiology's Mammographic Image Quality Course: Role of the Medical Physicist, January 1993, 18 CME credits awarded.

**MILITARY TRAINING:**

Nuclear Power Plant Operator Course (Health Physics Specialty), Ft. Belvoir, VA, 1 year, 1971.

AMEDD (MSC) Officer Basic Course, Ft. Sam Houston, TX, 9 weeks, 1972

AMEDD Officer Advanced Course, Ft. Sam Houston, TX, 24 weeks, 1975.

Command and General Staff Officer Course (Correspondence Option), 1 year, 1987.

Faculty Development Course, Academy of Health Sciences, Ft. Sam Houston, TX, 4 weeks, 1976.

Medical Effects of Nuclear Weapons, Armed Forces Radiobiology Research Institute, Bethesda, MD, 1 week, 1983.

Medical Physics and Military Medicine, US Army Environmental Hygiene Agency, Aberdeen Proving Ground, MD, 1 week, 1983, 1985, 1987, 1988, 1989, 1991, 1993.

**TEACHING EXPERIENCE:**

1990-1993, Assistant Professor of Preventive Medicine and Biometrics, Uniformed Services University of the Health Sciences, Bethesda, MD.

1977-1979, Instructor, Radiological Physics, Academy of Health Sciences, Ft. Sam Houston, TX.

1977-1979, Assistant Professor of Health Sciences, Baylor University at San Antonio, San Antonio, TX.

1969-1970, High School Teacher (Mathematics), Grant Community High School, Fox Lake, IL.

**PROFESSIONAL EXPERIENCE:**

1. June 1992 to May 1994, Chief, Health Physics Division, U.S. Army Environmental Hygiene Agency, Aberdeen Proving Ground, MD.

Duties: Leads and manages the Health Physics Division composed of the Medical Health Physics Branch, the Industrial Health Physics Branch and an Administrative Section. Directs the activities of

some 25 professional health physicists in world wide mission of support of U.S. Army Radiation Protection Programs. Support includes complete radiation protection program evaluations for compliance with Federal, Army, and Nuclear Regulatory Commission (NRC) Licenses for Medical and Industrial facilities, medical and industrial x-ray surveys, radiation dose assessments from bioassay data, assistance in preparation of documents to terminate NRC licenses, and conducting verification surveys for NRC License termination. Radiation protection policies are developed for the Army Surgeon General for implementation Army wide. Act as principle user of radioactive materials, supervisor of  $^{137}\text{Cs}$  irradiator for calibration, and member of the Radiation Control Committee.

2. June 1989 to June 1992, Deputy Director, Environmental Health and Occupational Safety; Chief, Radiation Safety and Radiation Protection Officer, Uniformed Service University of the Health Sciences (USUHS), Bethesda, MD.

Duties: Responsible for the supervision and management of broad scope US Nuclear Regulatory Byproduct Materials License No. 19-23344-01. Supervises health physics personnel in the performance of laboratory radiation protection surveys, personnel dosimetry program, laboratory analysis, and radioactive material control. Provides technical advice to some 350 radiation workers working in about 150 radioisotope laboratories. Teaches in various graduate level courses in Preventive Medicine and Radiology. Provides technical consultation to Director and other Branch Chiefs. Acts as the Director when the Director is absent. Has been designated the Medical Physics Consultant on acquisition and acceptance testing of Computerized Tomography (CT) Systems and Magnetic Resonance Imaging (MRI) Systems for the Army Surgeon General. This CT and MRI mission is world wide.

3. June 1983-June 1989, Chief, Health Physics, Dwight D. Eisenhower Army Medical Center, Ft. Gordon, GA.

Duties: Served as Chief, Health Physics, and Radiation Protection Officer. Responsible for supervision and management of broad scope radiation protection program including management of US Nuclear Regulatory Byproduct Materials License No. 10-12044-03 and Department of Army Radioactive Materials Authorization No. 10-07-81. Served as Regional Consultant to DOD Health Region 10, which includes 9 Army Community Hospitals, and clinics in Panama and Puerto Rico. Performs Technical Surveys of radioactive materials and radiation producing devices to evaluate health hazards and performs medical physics evaluations to optimize imaging. Provides education support to professional staff. Supervises the personnel dosimetry program and performs dosimetry analysis of both radiation workers and patients. Is the Medical Physics Consultant on acquisition and acceptance testing of Computerized Tomography (CT)

Systems and Magnetic Resonance Imaging (MRI) Systems for the Army Surgeon General. This CT and MRI mission is world wide.

4. September 1976 - June 1980, Chief, X-Ray Branch, Academy of Health Sciences, Ft. Sam Houston, TX.

Duties: Programs, plans and supervises overall operation of branch, including performance of 36 instructors and about 430 students annually. Branch is responsible for teaching the x-ray technologist program (radiographic) for the US Army. Also coordinates, plans, and supervises clinical training. Serves as Chairman of X-Ray Specialist Curriculum Committee, and Chairman of Medicine and Surgery Division Physics and Biophysics Committee. Serves as subject matter expert in radiology for Combat Development and Health Care Systems.

5. January 1975 - July 1975, Chief, Health Physics Branch, US Army Environmental Hygiene Agency Regional Activity South, Ft. Sam Houston, TX.

Duties: Conducts radiation protection surveys of US Army installations containing or generating ionizing radiation. Geographical area of support is all states west of the Mississippi River. Also reviews NRC license and DA Authorization applications. Performs technical consultation on radiation safety hazards.

6. March 1974 - December 1974, Chief, Department of Nuclear Medical Sciences, US Army Medical Laboratory, Ft. Sam Houston, TX.

Duties: Supervises laboratory procedures and techniques of radiation biology, radiochemistry, and biophysics for regional reference laboratory. Geographic area of support includes United States, Pacific Region, Korea, and Panama. Supervises radiation detection measurements, preparation and analysis of radioisotopes in support of diagnostic and other clinical procedures. Provides support on environmental surveillance. Advises on radiological hygiene matters to prevent unnecessary exposure of personnel to ionizing radiation. Performs duty of Chairman, Radioisotope Committee, and Radiological Protection Officer. Manages all aspects of AEC License No. 42-06316-01, and Department of Army Authorization for Radioactive Materials. Performs Health Physics surveys and overall monitoring of all Laboratory Departments engaged in work involving radioactive material.

7. January 1973 - February 1974, Survey Officer, Health Physics Division, US Army Environmental Hygiene Agency, Aberdeen Proving Ground, MD.

Duties: Reviews AEC license and Department of Army Authorizations applications as well as drafts Army directives and technical publications pertaining to radiological health; evaluates proposed

in-system items containing or generating ionizing radiation; makes on-site surveys of Army diagnostic, industrial, and therapeutic x-ray facilities, radioactive sources, accelerators, human use of radioisotopes and other sources of ionizing radiation; prepares reports with recommendations for corrective action; assists in training activities. Performs as Alternate Radiological Protection Officer. This requires preparation and maintenance of records and reports on receipt, issue, use, inventory, storage, and disposal of radioactive materials. Performs health physics surveys of all agency divisions engaged in working with radioactive materials.

8. September 1972 - October 1972, Health Physics Technician, SM1 Nuclear Power Plant, Ft. Belvoir, VA.

Duties: Conducts radiological surveys, performs treatment to maintain proper process fluid conditions of nuclear power plant. Operates nuclear power plant controls and equipment. Assists in refueling operations and preparing spent fuel elements and demineralizers for storage and shipment. Monitors process fluids for radioactivity and performs chemical separations. Conducts radiological surveys of nuclear power plant personnel, equipment, work areas and reactor elements.

#### **MEMBERSHIPS, PAPERS, PRESENTATIONS AND AWARDS:**

Member, Health Physics Society (1973)

Member, Eta Chapter, Delta Omega Society (1977)

"The Final Step in Decommissioning of the SM-1A Nuclear Power Plant: A Closeout Survey," AEHA Report No. 43-001-74, Health Physics National Meeting, 1974.

"A Data Base Management System For Real-Time Monitoring of Operating Parameters of A Diagnostic X-Ray System," Ph.D. Dissertation, University of North Carolina, Chapel Hill, NC, 1983.

"Computerized Quality Assurance in Diagnostic Radiology," Health Physics National Meeting, Baltimore, MD, 1983.

"Acceptance Testing of Computerized Tomography Systems," Savannah River Chapter Health Physics Society Meeting, September 1985.

"Operational Problems for a Radiation Protection Program at A Major Medical Institution," Medical Physics in Military Medicine Course, AEHA, MD, September 1987.

"A Protocol to Comply With The Joint Commission of Accreditation of Health Care Organizations Requirements in Diagnostic Radiology," Medical Physics In Military Medicine Course, AEHA, MD, October 1988.



REPLY TO  
ATTENTION OF

**DEPARTMENT OF THE ARMY**  
WALTER REED ARMY MEDICAL CENTER  
WALTER REED HEALTH CARE SYSTEM  
WASHINGTON, DC 20307-5001  
19 July 2002

RECEIVED  
REGION 1

2002 JUL 25 PM 2:17

Preventive Medicine Service

030-01317  
030-06895

Nuclear Regulatory Commission, Region I  
Medical Licensing Division  
475 Allendale Road  
King of Prussia, Pennsylvania 19406-1415

Dear Sir or Madam:

Walter Reed Army Medical Center uses radioactive material authorized by U.S. Nuclear Regulatory Commission (NRC) Byproduct Material License number 08-01738-02 with an expiration date of June 30, 2004 and Irradiator License number 08-1738-03 with an expiration date of November 30, 2011.

We request to change the Radiation Safety Officer (RSO) on both of the above licenses to Lieutenant Colonel John R. Mercier with an effective date of 15 August 2002. LTC Mercier's CV and NRC Form 313 are enclosed. LTC Mercier previously served for 4 years as the RSO on a Type A Broad Scope License (#53-C0458-04) at Tripler Army Medical Center.

For any additional information, please contact the undersigned at (202) 356-0058.

Sincerely,

*William B. Johnson*  
William B. Johnson, Ph.D.  
Radiation Safety Officer

Copy Furnish:

Director, Proponency Office for Preventive Medicine - San Antonio,  
ATTN: MCPO-SA (COL Daxon), 2050 Worth Road, Ft. Sam Houston, TX  
78234-6000

Information in this record was deleted  
in accordance with the Freedom of Information  
Act, exemptions 6  
FOIA- 2006-0238

NMSS/RONI MATERIALS-002

*mm/15*  
60  
NMSSB2 131859  
2006-0238

NRC FORM 313A  
(8-1999)

U.S. NUCLEAR REGULATORY COMMISSION

**TRAINING AND EXPERIENCE**

**Note:** Descriptions of training and experience must contain sufficient detail to match the training and experience criteria in the application regulations.

1. Name of Individual, Proposed Authorization (e.g. Radiation Safety Officer), and Applicable Training Requirements (e.g., 10CFR 35.50)

**LTC JOHN R. MERCIER, PH.D., PE, DABR**

2. For Physicians, State or Territory Where Licensed

**3. CERTIFICATION**

Specialty Board	Category	Month and Year Certified
American Board of Radiology	Diagnostic Radiological and Medical Nuclear Physics	June, 1995
Professional Engineer (Texas)	Nuclear Engineering License	March, 1995

**4. DIDACTIC TRAINING**

Description of Training	Location	Clock Hours	Dates of Training
Radiation Physics and Instrumentation	University of Texas at Austin	300	Sep 81 – Dec 84
	Cornell University, NY	300	Aug 89 – May 91
	Univ. of Texas Health Science Center	550	Aug 96 – Aug 99
Radiation Protection	University of Texas at Austin	50	Sep 81 – Dec 84
	Cornell University, NY	100	Aug 89 – May 91
	Univ. of Texas Health Science Center	150	Aug 96 – Aug 99
Mathematics Pertaining to the Use and Measurement of Radioactivity	University of Texas at Austin	200	Sep 81 – Dec 84
	Cornell University, NY	150	Aug 89 – May 91
	Univ. of Texas Health Science Center	100	Aug 96 – Aug 99
Radiation Biology	University of Texas at Austin	50	Sep 81 – Dec 84
	Cornell University, NY	150	Aug 89 – May 91
	Univ. of Texas Health Science Center	150	Aug 96 – Aug 99
Chemistry of Byproduct Material for Medical Use	Univ. of Texas Health Science Center	100	Aug 96 – Aug 99
Radiation Dosimetry	University of Texas at Austin	50	Sep 81 – Dec 84
	Cornell University, NY	150	Aug 89 – May 91
	Univ. of Texas Health Science Center	150	Aug 96 – Aug 99

<b>5. PRACTICAL EXPERIENCE WITH RADITION (Actual use of radionuclides or equivalent experience)</b>				
<b>Description of Experience</b>	<b>Name of Supervising Individual</b>	<b>Location and Corresponding Material License Number</b>	<b>Dates and Clock Hours of Experience</b>	<b>Related Radiation Safety Exam Score</b>
Nuclear Medical Science Officer, U.S. Army Environmental Hygiene Agency. Radiation protection, dosimetry and calibration duties for: Any byproduct material with atomic no.'s 1 - 84, any form, not to exceed 800 mCi each or 10 Ci total. Any byproduct material with atomic no.'s 1 - 100, any form, not to exceed 15 uCi each or 500 uCi total. J.L Shepard Cs-137 sealed 130 mCi calibration source. Various plutonium and uranium sources.	LTC Eugene Potter, CHP	Aberdeen Proving Ground, MD USNRC Licenses: #19-09880-01, #SMB-707and #SNM-860	Jan 85 - Dec 85 (900 hours)	N/A
Radiation Safety Officer, Darnall Army Community Hospital. Radiation protection, dosimetry radioactive waste management, health physics program management and calibration duties for: Any byproduct material with atomic no.'s 1 - 83 for use as radiopharmaceuticals in diagnosis and therapy. Various calibration sources.	MAJ Jerome Karwacki, M.D.	Fort Hood, TX USNRC License #42-19113-01	Jan 86 - Dec 88 (6000 hours)	N/A
Graduate Student, Cornell University. Senior reactor operator for TRIGA reactor, with $10^{14}$ neutron flux in core and $10^{12}$ neutron flux at beam ports. Gamma cell operator with 10 MCi Co-60 irradiation source.	Dr. K. Bingham Cady, Sc.D.	Ithaca, NY USNRC License #SOP-10973	Aug 89 - May 91 (1000 hours)	N/A
Project Engineer, Defense Nuclear Agency Plutonium Mining Project. Spectroscopy, calibration and respiratory protection duties for a unique environmental restoration project. Various plutonium and americium samples and sources.	Dr. Ed Bramlitt, Ph.D.	Johnston Island, Pacific Ocean	Jun 91 - Jun 92 (1000 hours)	N/A
Radiation Safety Officer (Broad Scope), Tripler Army Medical Center. Radiation protection, dosimetry radioactive waste management, health physics program management and calibration duties for: Any byproduct material with atomic no.'s 1 - 83 for use as radiopharmaceuticals in diagnosis and therapy. J.L Shepard Cs-137 sealed 2200 Ci irradiation source. Various calibration sources.	COL Tom Cashman, M.D.	Honolulu, HI USNRC License #53-00458-04	Jun 92 - Jun 96 (8000 hours)	N/A
Doctoral Candidate, University of Texas Health Science Center. Various research and calibration sources.	Dr. Dave Kopp, Ph.D.		Aug 96 - Aug 99 (100 hours)	N/A
Nuclear Scientist, U.S. Army Nuclear and Chemical Agency. Scientific editor and contributing author to a North Atlantic Treaty Organization allied engineering publication on sampling and identification of radiological agents.	Dr. Chuck Davidson, Ph.D.		Aug 99 - May 02 (500 hours)	N/A

**6. FORMAL TRAINING**

<b>Degree, Area of Study</b>	<b>Name of Program and Location with Corresponding Materials License Number</b>	<b>Dates</b>	<b>Name of Organization that Approved the Program (e.g., Accreditation Council for Graduate Medical Education) and the Applicable Regulation (e.g., 10 CFR 35.294)</b>
B.E.S., Nuclear Engineering M.Eng., Nuclear Engineering Ph.D., Radiological Physics	University of Texas at Austin Cornell University, NY Univ. of Texas Health Science Center	Ex 6	ABET Accredited ABET Accredited CAMPEP Accredited

**LIEUTENANT COLONEL JOHN R. MERCIER, Ph.D., PE, DABR**  
**Nuclear Medical Science Officer**  
**U.S. Army Nuclear and Chemical Agency**

wk: (703) 806-7860 cell: ( )  
mercier@usanca-smtp.army.mil

*Handwritten initials and a circled mark.*

**FORMAL EDUCATION**

Doctor of Philosophy (Radiological Physics), The University of Texas Health Science Center,  
San Antonio, Texas, *Ex 6*  
Master of Engineering (Nuclear), Cornell University, Ithaca, New York, *Ex 6*  
Bachelor of Engineering Science (Nuclear), The University of Texas, Austin, Texas,

**PROFESSIONAL CREDENTIALS**

Diplomate, American Board of Radiology, Dual Certified in Diagnostic Radiological Physics and  
Medical Nuclear Physics, ABR Physicist # P1779, 1995  
Licensed Medical Physicist, Texas, # MP0402, 1995  
Licensed Professional Nuclear Engineer, Texas PE Registration # 80363, 1995  
Licensed Nuclear Plant Senior Reactor Operator, TRIGA Reactor, NRC License #SOP-10973, 1990  
Certified Hazard Control Manager, International Board of Hazard Control Management,  
Master Certification # 2490, 1993

*Ex 6*

**CURRENT AFFILIATIONS AND PROFESSIONAL MEMBERSHIPS**

Sigma Xi – The Scientific Research Society  
Tau Beta Pi – The National Engineering Honor Society  
American Nuclear Society  
Health Physics Society  
\* Past-President for Hawaii Chapter  
American Association of Physicists in Medicine  
\* Member of Task Group 10 on computed radiography digital imaging  
North Atlantic Treaty Organization (NATO):  
U.S. Delegate to NATO Land Group 7 on Joint NBC Defense  
U.S. Delegate to NATO Land Group 7 Expert Subgroup on Sampling and  
Identification of Biological, Chemical and Radiological Agents  
U.S. Delegate to NATO Land Group 7, Expert Working Group on Low-Level  
Radiation  
U.S. Delegate to NATO Standardization Agency's NBC Working Group  
U.S. Delegate to NATO Standardization Agency's Medical NBC Working Party  
U.S. Delegate to NATO Research and Technology Board's Task Group on  
Radiation Treatments and Countermeasures  
The Technical Cooperation Program (TTCP) of the American, British, Canadian, and  
Australian (ABCA) Alliance:  
Member, Action Group 48 on Radiation Hazards  
Department of Defense:  
Chair, DoD Weapons of Mass Destruction Human Response Panel  
Member, Nuclear Warfare Casualty Panel of Experts, Joint Readiness  
Clinical Advisory Board  
Department of the Army:  
Alternate Army Reactor Officer  
Member, Nuclear Employment Augmentation Team

## PUBLICATIONS

Anno, G., R. Bloom, **J. R. Mercier**, R. W. Young, *Dose Response Functions for Acute Radiation Lethality*, submitted to Health Physics, 2002.

Lankipalli, B. R., W. D. McDavid, S. B. Dove, E. Wieckowska, R. G. Waggener, and **J. R. Mercier**, *Comparison of Five Methods for the Derivation of Spectra for a Constant Potential Dental X-Ray Unit*, *Dentomaxillofacial Radiology*, 30, 2001, p. 264-269.

**Mercier, J. R.**, *Commander's Guide on Low-Level Radiation (LLR) Exposure in Military Operations*, Edition 2, Draft Standardization Agreement 2473, North Atlantic Treaty Organization, 2002.

**Mercier, J. R.**, *Commander's Guide on Nuclear Radiation Exposure of Groups During War*, Edition 6, NATO Standardization Agreement 2083, North Atlantic Treaty Organization, 2001.

**Mercier, J. R.**, D. T. Kopp, W. D. McDavid, S. B. Dove, J. L. Lancaster, and D. M. Tucker, *Modification and Benchmarking of MCNP for Low-Energy Tungsten Spectra*, *Medical Physics*, 27(12), 2000, p. 2680-2687.

**Mercier, J. R.**, D. T. Kopp, W. D. McDavid, S. B. Dove, J. L. Lancaster, and D. M. Tucker, *Measurement and Validation of Benchmark-Quality Thick-Target Tungsten X-Ray Spectra below 150 kVp*, *Radiation Research*, 154, 2000, p. 564-581.

**Mercier, J. R.**, D. T. Kopp, W. D. McDavid, S. B. Dove, J. L. Lancaster, and D. M. Tucker, *Using Measured 30-150 kVp Polychromatic Tungsten X-Ray Spectra to Determine Ion Chamber Calibration Factors*, *Health Physics*, 79(4), 2000, p. 402-406.

**Mercier, J. R.** (Ed.), *NATO Handbook for Sampling and Identification of Radiological Agents, Volume 1 (Operational)*, Allied Engineering Publication 49, North Atlantic Treaty Organization, 2000.

**Mercier, J. R.**, *Medical Aspects of Nuclear Weapons and Radiation Effects*, Chapter 3 of the FY 01/02 Army Specific Military Requirements for Nuclear and Radiation Effects Information, published by the U.S. Army Deputy Chief of Staff for Operations and Plans (DCSOPS), August 2000.

**Mercier, J. R.**, *Measurement and Monte Carlo Prediction of Diagnostic Tungsten X-Ray Spectra*, Ph.D. Dissertation, Graduate School of Biomedical Sciences, The University of Texas Health Science Center, San Antonio, TX, 1999. Available from UMI Dissertation Services, Ann Arbor, MI, 1999, UMI No. 9938769.

Seibert, J. A. (Chair), T. Bogucki, T. Ciona, J. Dugan, W. Huda, A. Karellas, **J. Mercier**, E. Samai, J. Sheppard, B. Stewart, O. Suleiman, D. Tucker, R. Uzenoff, J. Weiser, and C. Willis, *Acceptance Testing and Quality Control of Photostimulable Storage Phosphor Imaging Systems, Report of Task Group #10*, American Association of Physicists in Medicine, 1998.

Willis, C. E., **J. Mercier**, M. Patel, *Modification of Conventional Quality Assurance Procedures to Accommodate Computed Radiography*, Proceedings of the 13<sup>th</sup> Conference of Computer Applications in Radiology, Society for Computer Applications in Radiology, Denver, CO, 1996.

**Mercier, J. R.**, and Bramlitt, E. T., *A Soil Cleanup on Johnston Atoll*, Proceedings of the First Symposium on Soil Cleanup in the Pacific Islands, American Society of Civil Engineers, Honolulu, HI, 1993.

Moroney, J. D., Johnson, N. R., Moroney, K. S., **Mercier, J. R.**, *An Improved Method for Removing Transuranics from Coral Soil at Johnston Atoll*, Proceedings of the 1992 Federal Environmental Restoration Conference, Hazardous Materials Control Resources Institute, Vienna, VA, 1992.

## ABSTRACTS AND POSTERS

Liu, H. L., Y. Pu, T. Andrews, **J. Mercier**, P. T. Fox, and J.-H. Gao, Cerebral Blood Flow Measurement Using Adaptive Threshold for Singular Value Decomposition Technique on Dynamic Contrast Agent MR Perfusion Imaging, 7<sup>th</sup> Meeting of the International Society for Magnetic Resonance in Medicine, Philadelphia, PA, 1999.

**Mercier, J. R.**, D. T. Kopp, D. M. Tucker, C. E. Willis and J. L. Lancaster, X-Ray Spectra Resolution Requirements for Characterization of Image Receptors, 84<sup>th</sup> Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL, 1998.

**Mercier, J.** and D. Kopp, Preliminary Evaluation of the Monte Carlo Code MCNP4b for Diagnostic X-Ray Spectra, 40<sup>th</sup> Annual Meeting of the American Association of Physicists in Medicine, Medical Physics, 1998, 25(7): p.A105.

Willis, C. E., **J. R. Mercier**, M. G. Patel, Unresolved Issues in Computed Radiography, 38<sup>th</sup> Annual Meeting of the American Association of Physicists in Medicine, Medical Physics, 1996, 23(6): p.1076.

## PROFESSIONAL AND LEADERSHIP EXPERIENCE

**Nuclear Scientist** 8/99 - present  
U.S. Army Nuclear and Chemical Agency, Springfield, VA

Primary consulting subject matter expert (SME) to Army Staff and other DoD/NATO/U.S. Government agencies on the medical effects of nuclear weapons and radiation. Sets policy on friendly troop safety risk criteria and enemy personnel casualty criteria for nuclear weapons effects. Develops casualty estimation models for nuclear, biological and chemical (NBC) weapons. Serves on numerous DoD and NATO SME panels for NBC research, operational doctrine and equipment development. Develops Army R&D requirements for radiobiology, biomedical technology and NBC operations. Serves as Alternate Army Reactor Officer for the Army Reactor Office that maintains oversight of WSMR and APG fast burst reactors. Serves on the Nuclear Employment Augmentation Team in support of CINC's.

**Doctoral Student** 8/96 - 8/99  
The University of Texas Health Science Center, San Antonio, TX

Research focused on diagnostic imaging, the use of Monte Carlo codes to simulate x-ray beam formation and transport, measurement of x-ray spectra, computed radiography and other digital imaging systems. Teaching duties and course work broadly covered the medical radiological physics profession.

**Chief, Health Physics** 6/92 - 6/96  
Tripler Army Medical Center, Honolulu, HI 96859-5000

Executive agent and Radiation Safety Officer for a broad-scope USNRC radioactive material license (#53-00458-04). Directed comprehensive health physics services for a major teaching and research hospital. Developed or approved nuclear medicine, diagnostic radiology and radiation therapy QC protocols. Performed gamma camera acceptance testing. Evaluated and approved all Pacific region radiological facility designs. Conducted health and medical physics audits. Routinely provided formal and informal radiation safety training and imaging science lectures to nuclear medicine and radiology technologists. Routinely counseled physicians, patients, and hospital staff on radiation effects. Occasionally lectured radiology residents in imaging physics.

**Project Engineer, Johnston Atoll Plutonium Mining Project** 5/91 - 6/92  
Defense Nuclear Agency, Kirtland AFB, NM 87115-5000

Spearheaded the Defense Nuclear Agency's \$15 million Plutonium Mining Project. Led world's first successful remediation of plutonium contaminated soil. Designed several multichannel analyzer radioassay systems using sodium iodide and high-pure germanium spectroscopy detectors. Developed and enforced various radiation safety, bioassay, and respiratory protection programs.

**Graduate Student** 8/89 - 5/91  
Cornell University, Ithaca, NY

Research focused on characterizing radiation damage to electronic components using the Cornell gamma irradiation facility. Gained experience as a federally licensed nuclear plant senior reactor operator (License # SOP-10973) that required mastery of all research facilities and radiological monitoring equipment within the reactor building. Developed experimental research protocols for the TRIGA reactor and assisted in training a reactor operator. Course work broadly covered the nuclear engineering profession.

**Radiation Protection Officer** 12/85 - 12/88  
Darnall Army Community Hospital, Ft Hood, TX 76544-5063

Executive agent and Radiation Safety Officer for USNRC limited-scope radioactive material license (#42-19113-01). Hospital consultant for health physics, diagnostic radiology physics, & medical nuclear physics. Developed radiation protection, radiology QA/QC, & nuclear medicine QA/QC programs. Performed health & medical physics audits, calibrations, x-ray system & shielding surveys. Troubleshooted image quality problems. Trained all radiation workers.

**Nuclear Medical Science Officer** 1/85 - 12/85  
US Army Environmental Hygiene Agency, APG, MD 21010-5422

Consulted Army and DoD installations for adequate radiation protection, radiology QA/QC, and nuclear medicine QA/QC programs. Wrote safety and QC procedures and evaluated x-ray system performance. Conducted radiological shielding evaluations and health hazard assessments of equipment and facilities.

**Commander, Detachment 1, A Company** 12/82 - 12/84  
249<sup>th</sup> Supply and Transport Battalion, 49<sup>th</sup> Armored Division,  
Texas Army National Guard, Killeen, TX

Exercised command. Led with honor and respect.

**Platoon Leader, HHQ Company** 8/81 - 11/82  
249<sup>th</sup> Supply and Transport Battalion, 49<sup>th</sup> Armored Division,  
Texas Army National Guard, Austin, TX

Developed leadership skills.



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION I  
475 ALLENDALE ROAD  
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

August 8, 2002

Docket Nos. 03001317  
03006895  
Control Nos. 131859  
131860

License Nos. 08-01738-02  
08-01738-03

William B. Johnson, Ph.D.  
Radiation Safety Officer  
Department of the Army  
Walter Reed Army Medical Center (WRAMC)  
Washington, DC 20307-5001

SUBJECT: DEPARTMENT OF THE ARMY, ISSUANCE OF LICENSE AMENDMENT,  
CONTROL NOS. 131859 AND 131860

Dear Dr. Johnson:

This refers to your request dated July 19, 2002, for amendment to the above listed NRC licenses. Enclosed with this letter are the amended licenses.

Please review the enclosed documents carefully and be sure that you understand and fully implement all the conditions incorporated into the amended licenses. If there are any errors or questions, please notify the U.S. Nuclear Regulatory Commission, Region I Office, Licensing Assistance Team, (610) 337-5239, so that we can provide appropriate corrections and answers.

In accordance with 10 CFR 2.790, a copy of this letter will be placed in the NRC Public Document Room and will be accessible from the NRC Web site at <http://www.nrc.gov/reading-rm.html>.

Thank you for your cooperation.

Sincerely,

**Original signed by Sattar Lodhi, Ph.D.**

Sattar Lodhi, Ph.D.  
Health Physicist  
Nuclear Materials Safety Branch 2  
Division of Nuclear Materials Safety

Information in this record was deleted  
in accordance with the Freedom of Information  
Act, exemptions 2  
FOIA- 2006-0228

~~ML 022210023~~

mm/16

W. Johnson  
Department of the Army

2

Enclosures:

Amendment No. 74 (License No. 08-01738-02)

Amendment No. 28 (License No. 08-01738-03)

cc:

LTC John R. Mercier, Ph.D., Radiation Safety Officer

COL Eric Daxon, Director, Proponency Office of Preventive Medicine

DOCUMENT NAME: G:\Docs\Current\Lic Cvr Letter\L08-01738-02.131859.wpd

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OFFICE	DNMS/RI	N	DNMS/RI	DNMS/RI			
NAME	SLodhi						
DATE	8/8/02						

OFFICIAL RECORD COPY

Duplicate

MATERIALS LICENSE

Duplicate

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.

<p>Licensee</p> <p>1. Department of the Army Walter Reed Army Medical Center (WRAMC)</p> <p>2. Washington, D.C. 20307-5001</p>	<p>In accordance with the letter dated July 19, 2002,</p> <p>3. License number 08-01738-02 is amended in its entirety to read as follows:</p> <hr/> <p>4. Expiration date June 30, 2004</p> <hr/> <p>5. Docket No. 030-01317 Reference No.</p>
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<p>6. Byproduct, source, and/or special nuclear material</p> <p>A. Any byproduct material with atomic numbers 1-83</p> <p>B. Iodine 131</p> <p>C. Xenon 133</p> <p>D. Krypton 85</p> <p>E. Phosphorus 32</p> <p>F. Carbon 14</p> <p>G. Iodine 125</p> <p>H. Iridium 192</p> <p>I. Chromium 51</p> <p>J. Sulfur 35</p> <p>K. Hydrogen 3</p> <p>L. Molybdenum 99</p> <p>M. Technetium 99m</p>	<p>7. Chemical and/or physical form</p> <p>A. Any</p> <p>B. Any</p> <p>C. Any</p> <p>D. Any</p> <p>E. Any</p> <p>F. Any</p> <p>G. Any</p> <p>H. Any</p> <p>I. Any</p> <p>J. Any</p> <p>K. Any</p> <p>L. Molybdenum 99/ Technetium 99m Generators</p> <p>M. Any</p>	<p>8. Maximum amount that licensee may possess at any one time under this license</p> <p>A. 400 millicuries of each radionuclide with a total possession limit of 26 curies</p> <p>B. 2 curies</p> <p>C. 2 curies</p> <p>D. 1 curie</p> <p>E. 2 curies</p> <p>F. 2 curies</p> <p>G. 1 curie</p> <p>H. <input type="checkbox"/></p> <p>I. 750 millicuries</p> <p>J. 1 curie</p> <p>K. 5 curies</p> <p>L. 23 curies</p> <p>M. 23 curies</p>
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Duplicate MATERIALS LICENSE SUPPLEMENTARY SHEET

Duplicate

License Number

08-01738-02

Duplicate

Docket or Reference Number

030-01317

Amendment No. 74

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

N. Strontium 90

N. Sealed sources

N.

O. Cesium 137

O. Sealed sources

O.

P. Gadolinium 153

P. Sealed sources

P.

Q. Iodine 125

Q. Sealed sources (3M Company seeds)

Q. 1 curie

R. Iodine 125

R. Sealed sources (Norland Inst. Co., Model 178A591A or AECL Models C235 or C324, or Amersham Corp Model IMC.P2)

R. 4 sources, not to exceed 300 millicuries each

S. Cesium 137

S. Sealed sources

S.

T. Cobalt 60

T. Sealed sources

T.

U. Americium 241

U. Any

U. 100 microcuries

V. Americium 241

V. Sealed sources

V.

W. Nickel 63

W. Sealed sources and foils

W. 1 curie

X. Iodine 129

X. Sealed sources

X. 1 curie

Y. Thorium

Y. Any

Y. 5 kilograms

Z. Uranium

Z. Any

Z. 50 kilograms

AA. Cesium 137

AA. Sealed sources

AA.

BB. Americium 241

BB. Sealed sources

BB.

CC. Paladium 103

CC. Sealed sources

CC. 3 curies

DD. Iridium 192

DD. Sealed sources

DD.

EE. Uranium depleted in Uranium 235

EE. Plated Metal

EE. 400 Kilograms

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Duplicate

Duplicate

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**MATERIALS LICENSE  
 SUPPLEMENTARY SHEET**

Duplicate

License Number

08-01738-02

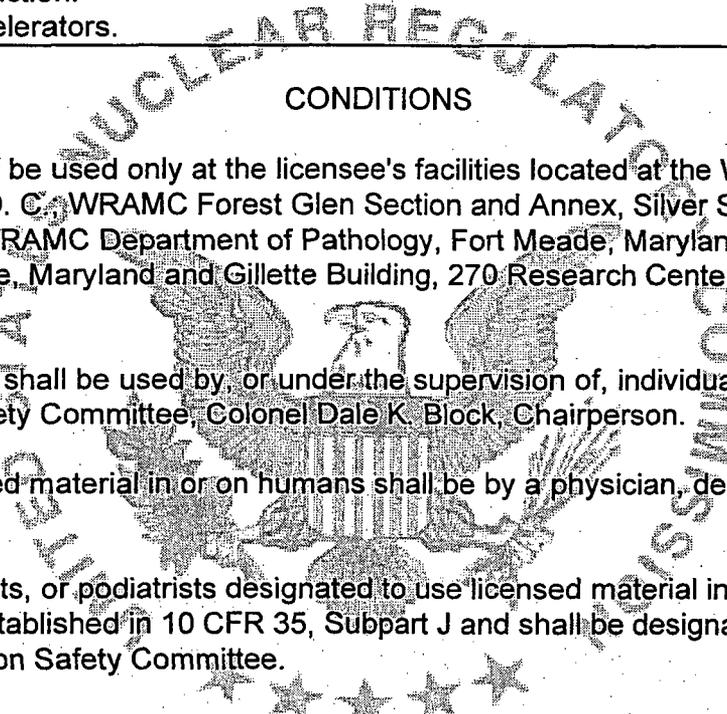
Docket or Reference Number

030-01317

Amendment No. 74

## 9. Authorized use:

- A. through DD. Medical diagnosis, therapy and research in humans in accordance with any applicable Food and Drug Administration (FDA) requirements. Research and development as defined in 10 CFR 30.4, including animal studies; instrument calibration; student instruction.
- EE. Shielding in linear accelerators.


 CONDITIONS

10. Licensed material may be used only at the licensee's facilities located at the Walter Reed Army Medical Center, Washington, D. C.; WRAMC Forest Glen Section and Annex, Silver Spring, Maryland; U.S. Army Medical Laboratory, WRAMC Department of Pathology, Fort Meade, Maryland; Rickman Building, 13 Taft Court, Rockville, Maryland and Gillette Building, 270 Research Center, 1413 Research Boulevard, Rockville, Maryland.
11. A. Licensed material shall be used by, or under the supervision of, individuals designated in writing by the Radiation Safety Committee, Colonel Dale K. Block, Chairperson.
- B. The use of licensed material in or on humans shall be by a physician, dentist, or podiatrist as defined in 10 CFR 35.2.
- C. Physicians, dentists, or podiatrists designated to use licensed material in or on humans shall meet the training criteria established in 10 CFR 35, Subpart J and shall be designated in writing by the licensee's Radiation Safety Committee.
- D. Individuals designated to work as medical physicists for intravascular brachytherapy shall meet the training and experience criteria established in 10 CFR 35.961; or be named on a current U.S. Nuclear Regulatory Commission or Agreement State license, or a permit issued under a broad scope license as a medical physicist; and shall be designated, in writing, by the Radiation Safety Committee. In addition, the physicist must meet the recentness of training requirement in 10 CFR 35.972 and have recent, device-specific training and experience for each make and model of intravascular brachytherapy device used by the licensee.
- E. The Radiation Safety Officer for this license is Lieutenant Colonel John R. Mercier.
12. 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 10 CFR 30.72 which require consideration of the need for an emergency plan for responding to a release of licensed material.

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Amendment No. 74

13. Notwithstanding the requirements of 10 CFR 35.49(a) and (b), 35.100, 35.200, 35.300, 35.400 and 35.500 the licensee may use for any medical use any byproduct material or reagent kit. The licensee shall possess and use byproduct material for medical use in accordance with the prescriptive and performance criteria in the other sections of 10 CFR 35. This does not relieve the licensee from complying with applicable U.S. Food and Drug Administration (FDA) and other Federal and State requirements.
14. 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.
15. The licensee shall conduct a physical inventory every three months to account for all sealed sources and devices containing licensed material received and possessed pursuant to 10 CFR 35.59, 35.400 and 35.500 and every six months for all other sealed sources and devices.
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 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.
- 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

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- (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.
17. Sealed sources or detector cells containing licensed material shall not be opened or sources removed from source holders by the licensee.
18. The licensee is authorized to hold radioactive material with a physical half-life of less than 65 days and Sulfur 35, Cobalt 58, Iridium 192, Scandium 46, 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.
19. The licensee shall possess and use byproduct material for human research in accordance with the prescriptive and performance criteria in all sections of 10 CFR Part 35 except sections 35.49(a) and (b), 35.100, 35.200, and 35.300.

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Amendment No. 74

20. Experimental animals, or the products from experimental animals, that have been administered licensed materials shall not be used for human consumption.
21. The licensee is authorized to transport licensed material in accordance with the provisions of 10 CFR Part 71, "Packaging and Transportation of Radioactive Material."
22. The licensee shall not acquire licensed material in a sealed source or device unless the source or device has been registered with the U.S. Nuclear Regulatory Commission pursuant to 10 CFR 32.210 or equivalent regulations of an Agreement State.
23. 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/application dated September 9, 1993 and October 29, 1993.
24. Notwithstanding the requirements of 10 CFR 35.315(a)(7), the licensee may control contamination in rooms used to house radiopharmaceutical therapy patients in accordance with the commitments and procedures contained in the letters dated April 8, 1992 and November 24, 1992.
25. 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, except for minor changes in the medical use radiation safety procedures as provided in 10 CFR 35.31. The U.S. 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 January 21, 1993  
 B. Letter dated September 9, 1993  
 C. Letter dated October 29, 1993  
 D. Letter dated December 9, 1993  
 E. Letter dated February 15, 1994  
 F. Letter dated June 2, 1994  
 G. Letter dated December 6, 1996

For the U.S. Nuclear Regulatory Commission

*Original signed by Sattar Lodhi, Ph.D.*

Date August 8, 2002

By

Sattar Lodhi, Ph.D.  
 Nuclear Materials Safety Branch 2  
 Division of Nuclear Materials Safety  
 Region I  
 King of Prussia, Pennsylvania 19406

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UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION I  
475 ALLENDALE ROAD  
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

January 8, 2003

Docket Nos. 03001317  
03006895  
Control Nos. 132452  
132453

License Nos. 08-01738-02  
08-01738-03

Thomas M. Fitzpatrick, M.D., Ph.D.  
Deputy Commander for Clinical Services and Chair, Radiation Control Committee  
Department of the Army  
Walter Reed Army Medical Center (WRAMC)  
Washington, DC 20307-5001

SUBJECT: DEPARTMENT OF THE ARMY, ISSUANCE OF LICENSE AMENDMENT,  
CONTROL NO. 132452 AND VOIDANCE OF APPLICATION FOR LICENSE  
AMENDMENT, CONTROL NO. 132453

Dear COL Fitzpatrick:

This refers to your license amendment request naming you as Chair of the Radiation Control Committee. Enclosed with this letter is amended broadscope license (License No. 08-01738-02). Since your irradiator license does not require a Radiation Control Committee, your amendment request is not necessary for License No. 08-01738-03. This matter was discussed with your Radiation Safety Officer on January 7, 2003. We have, therefore, voided your application to amend License No. 08-01738-03 (irradiator license). This action is taken without prejudice to the resubmission of your request.

Please review the enclosed document carefully and be sure that you understand and fully implement all the conditions incorporated into the amended license. Please note the last condition on your license indicates that, "This license condition applies only to those procedures that are required to be submitted in accordance with the regulations." Therefore, any procedures submitted that were not required by regulation to be submitted, e.g., calibration of dose calibrators, will not be considered a part of your license and were not reviewed during the licensing process. These procedures will be reviewed during inspections, as necessary. If there are any errors or questions, please notify the U.S. Nuclear Regulatory Commission, Region I Office, Licensing Assistance Team, (610) 337-5239, so that we can provide appropriate corrections and answers.

In accordance with 10 CFR 2.790, a copy of this letter will be placed in the NRC Public Document Room and will be accessible from the NRC Web site at <http://www.nrc.gov/reading-rm.html>.

Information in this record was deleted  
in accordance with the Freedom of Information  
Act, exemptions: 2  
FOIA- 2006-0238

mm/17

~~ML030040491~~

T. Fitzpatrick  
Department of the Army

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Thank you for your cooperation.

Sincerely,

***Original signed by Elizabeth Ullrich***

Elizabeth Ullrich  
Senior Health Physicist  
Nuclear Materials Safety Branch 2  
Division of Nuclear Materials Safety

Enclosures:

1. Amendment No. 75 for License No. 08-01738-02
2. NUREG-1556 Volumes 5, 9, and 11
3. NRC Forms 3 and 313
4. 10 CFR Part 2, 19, 20, 21, 30, 31, and 35

cc w/encl:

John R. Mercier, Radiation Safety Officer

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DATE	1/8/2003		1/8/03				

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MATERIALS LICENSE

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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.

<p>Licensee</p> <p>1. Department of the Army Walter Reed Army Medical Center (WRAMC)</p> <p>2. Washington, D.C. 20307-5001</p>	<p>In accordance with the letter dated November 22, 2002,</p> <p>3. License number 08-01738-02 is amended in its entirety to read as follows:</p> <p>4. Expiration date June 30, 2004</p> <p>5. Docket No. 030-01317 Reference No.</p>
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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. Phosphorus 32	E. Any	E. 2 curies
F. Carbon 14	F. Any	F. 2 curies
G. Iodine 125	G. Any	G. 1 curie
H. Iridium 192	H. Any	H. [ ] Ex 2
I. Chromium 51	I. Any	I. 750 millicuries
J. Sulfur 35	J. Any	J. 1 curie
K. Hydrogen 3	K. Any	K. 5 curies
L. Molybdenum 99	L. Molybdenum 99/ Technetium 99m Generators	L. 23 curies

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License Number

08-01738-02

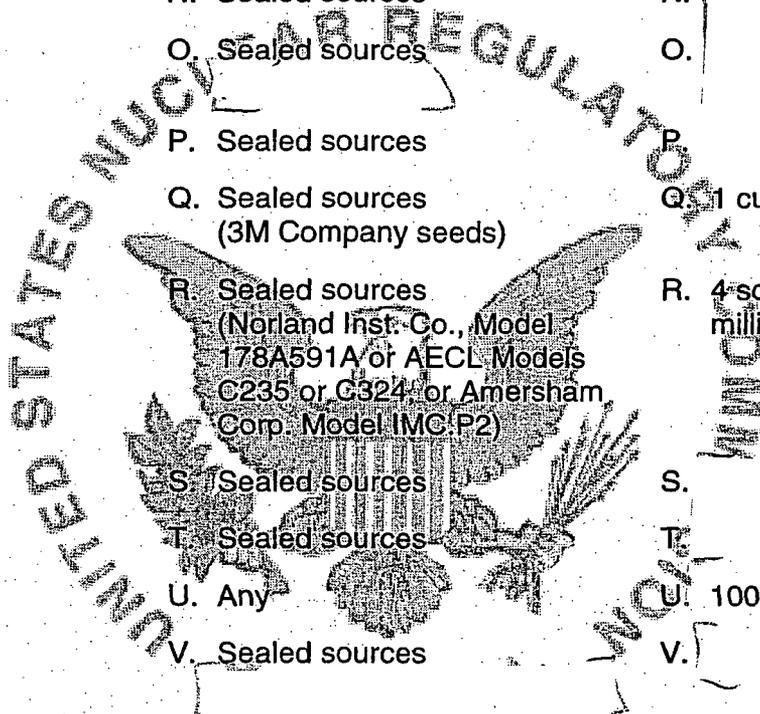
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Docket or Reference Number

030-01317

Amendment No. 75

- |   |  |  |
|---|--|--|
| 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 |
| M. Technetium 99m                                     | M. Any   | M. 23 curies   |
| N. Strontium 90                                       | N. Sealed sources  | N. [ ]   |
| O. Cesium 137   | O. Sealed sources  | O. [ ]   |
| P. Gadolinium 153                                     | P. Sealed sources  | P. [ ]   |
| Q. Iodine 125   | Q. Sealed sources (3M Company seeds)   | Q. 1 curie   |
| R. Iodine 125   | R. Sealed sources (Norland Inst. Co., Model 178A591A or AECL Models C235 or C324 or Amersham Corp. Model IMC.P2) | R. 4 sources, not to exceed 300 millicuries each                               |
| S. Cesium 137   | S. Sealed sources  | S. [ ]   |
| T. Cobalt 60  | T. Sealed sources  | T. [ ]   |
| U. Americium 241                                      | U. Any   | U. 100 microcuries   |
| V. Americium 241                                      | V. Sealed sources  | V. [ ]   |
| W. Nickel 63  | W. Sealed sources and foils  | W. 1 curie   |
| X. Iodine 129   | X. Sealed sources  | X. 1 curie   |
| Y. Thorium  | Y. Any   | Y. 5 kilograms   |
| Z. Uranium  | Z. Any   | Z. 50 kilograms  |
| AA. Cesium 137  | AA. Sealed sources   | AA. [ ]  |
| BB. Americium 241                                     | BB. Sealed sources   | BB. [ ]  |



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License Number  
 08-01738-02

Docket or Reference Number  
 030-01317

Amendment No. 75

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|---|----------------------------------|--|
| 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 |
| CC. Palladium 103                                     | CC. Sealed sources               | CC. 3 curies   |
| DD. Iridium 192                                       | DD. Sealed sources               | DD. [ ] Ex 2   |
| EE. Uranium depleted in Uranium 235                   | EE. Plated Metal                 | EE. 400 Kilograms  |

9. Authorized use:

- A. through DD. Medical diagnosis, therapy and research in humans in accordance with any applicable Food and Drug Administration (FDA) requirements. Research and development as defined in 10 CFR 30.4 including animal studies; instrument calibration; student instruction.
- EE. Shielding in linear accelerators.

CONDITIONS

10. Licensed material may be used only at the licensee's facilities located at the Walter Reed Army Medical Center, Washington, D. C.; WRAMC Forest Glen Section and Annex, Silver Spring, Maryland; U.S. Army Medical Laboratory, WRAMC Department of Pathology, Fort Meade, Maryland; Rickman Building, 13 Taft Court, Rockville, Maryland and Gillette Building, 270 Research Center, 1413 Research Boulevard, Rockville, Maryland.
11. A. Licensed material shall be used by, or under the supervision of, individuals designated in writing by the Radiation Safety Committee, Colonel Thomas M. Fitzpatrick, Chairperson.
- B. The use of licensed material in or on humans shall be by a physician, dentist, or podiatrist as defined in 10 CFR 35.2.
- C. Physicians, dentists, or podiatrists designated to use licensed material in or on humans shall meet the training criteria established in 10 CFR 35, Subpart J and shall be designated in writing by the licensee's Radiation Safety Committee.

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- D. Individuals designated to work as medical physicists for intravascular brachytherapy shall meet the training and experience criteria established in 10 CFR 35.961; or be named on a current U.S. Nuclear Regulatory Commission or Agreement State license, or a permit issued under a broad scope license as a medical physicist; and shall be designated, in writing, by the Radiation Safety Committee. In addition, the physicist must meet the recentness of training requirement in 10 CFR 35.972 and have recent, device-specific training and experience for each make and model of intravascular brachytherapy device used by the licensee.
- E. The Radiation Safety Officer for this license is Lieutenant Colonel John R. Mercier.
12. 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 10 CFR 30.72 which require consideration of the need for an emergency plan for responding to a release of licensed material.
13. Notwithstanding the requirements of 10 CFR 35.49(a) and (b), 35.100, 35.200, 35.300, 35.400 and 35.500 the licensee may use for any medical use any byproduct material or reagent kit. The licensee shall possess and use byproduct material for medical use in accordance with the prescriptive and performance criteria in the other sections of 10 CFR 35. This does not relieve the licensee from complying with applicable U.S. Food and Drug Administration (FDA) and other Federal and State requirements.
14. 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.
15. The licensee shall conduct a physical inventory every three months to account for all sealed sources and devices containing licensed material received and possessed pursuant to 10 CFR 35.59, 35.400 and 35.500 and every six months for all other sealed sources and devices.
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 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.

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- 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.
- 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.

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Amendment No. 75

17. Sealed sources or detector cells containing licensed material shall not be opened or sources removed from source holders by the licensee.
18. The licensee is authorized to hold radioactive material with a physical half-life of less than 65 days and Sulfur 35, Cobalt 58, Iridium 192, Scandium 46, 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.
19. The licensee shall possess and use byproduct material for human research in accordance with the prescriptive and performance criteria in all sections of 10 CFR Part 35 except sections 35.49(a) and (b), 35.100, 35.200, and 35.300.
20. Experimental animals, or the products from experimental animals, that have been administered licensed materials shall not be used for human consumption.
21. The licensee is authorized to transport licensed material in accordance with the provisions of 10 CFR Part 71, "Packaging and Transportation of Radioactive Material."
22. The licensee shall not acquire licensed material in a sealed source or device unless the source or device has been registered with the U.S. Nuclear Regulatory Commission pursuant to 10 CFR 32.210 or equivalent regulations of an Agreement State.
23. 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/application dated September 9, 1993 and October 29, 1993.

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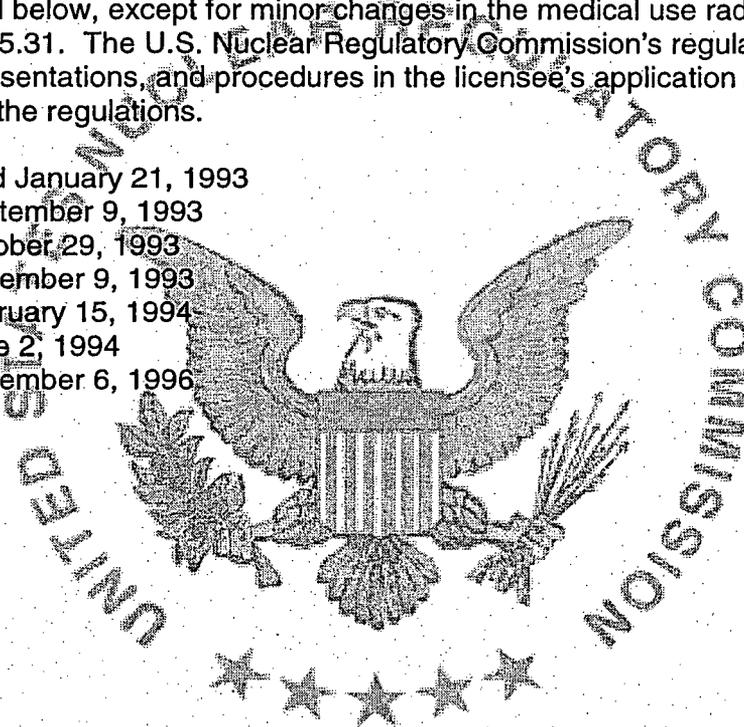
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030-01317

Amendment No. 75

- 24. Notwithstanding the requirements of 10 CFR 35.315(a)(7), the licensee may control contamination in rooms used to house radiopharmaceutical therapy patients in accordance with the commitments and procedures contained in the letters dated April 8, 1992 and November 24, 1992.
- 25. 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, except for minor changes in the medical use radiation safety procedures as provided in 10 CFR 35.31. The U.S. 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 January 21, 1993
  - B. Letter dated September 9, 1993
  - C. Letter dated October 29, 1993
  - D. Letter dated December 9, 1993
  - E. Letter dated February 15, 1994
  - F. Letter dated June 2, 1994
  - G. Letter dated December 6, 1996



For the U.S. Nuclear Regulatory Commission

*Original signed by Elizabeth Ullrich*

Date January 8, 2003

By \_\_\_\_\_  
 Elizabeth Ullrich  
 Nuclear Materials Safety Branch 2  
 Division of Nuclear Materials Safety  
 Region J  
 King of Prussia, Pennsylvania 19406

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