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2009 SEP 11 AM 10:57

September 10, 2009

U.S. Nuclear Regulatory Commission, Region I
Nuclear Material Section B
475 Allendale Road
King of Prussia, Pennsylvania 19406-1415

**SUBJECT: MEDSTAR GEORGETOWN MEDICAL CENTER REQUEST FOR
AMENDMENT TO NRC MATERIALS LICENSE**

Reference: NRC License 08-30577-01

03035409

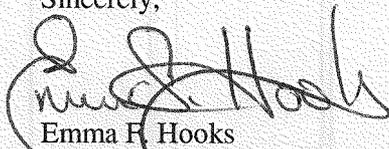
This is to request to amend NRC Materials License 08-30577-01. MedStar Georgetown Medical Center (Georgetown University Hospital) is requesting an amendment to change the Radiation Safety Officer to Dennis P. Clum, CHP.

In support of the request to add Dennis Clum as the Radiation Safety Officer, enclosed you will find:

- RSO Delegation of Authority Memo,
- Completed NRC Form 313A,
- Copy of Mr Clum's resume,
- Copy of Mr Clum's certification by the American Board of Health Physics,
- Copy of current Riverside Methodist Hospital's medical radioactive material's license issued by an agreement-state (Ohio) listing Dennis Clum as the RSO,
- Copy of current Ohio State University and Medical Center's broadscope Type A medical license issued by Ohio that Dennis Clum worked under as a Senior Health Physicist,
- Copy of Battelle Memorial Institute's 1997 broadscope research & development radioactive material license issued by the U.S. NRC where Dennis Clum served as RSO.

If you have any questions, or require additional information, please do not hesitate to contact Mr. Clum at (614) 561-7289 or email him at dennis.p.clum@gunet.georgetown.edu.

Sincerely,



Emma F. Hooks

Assistant Vice-President of Safety Management, Environmental Quality

Enclosure

144156
NRC/REGNI MATER. ALS-002

Date: August 24, 2009

To: Dennis P. Clum, CHP
Director Radiation Safety/RSO
Radiation Safety Department

From: Emma F. Hooks
AVP
Safety Management, Environmental Quality

Subject: Delegation of Authority

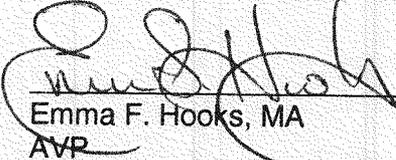
You, Dennis P. Clum, have been appointed the Radiation Safety Officer and are responsible for ensuring the safe use of radiation at Georgetown University Hospital. A license amendment to our U.S. NRC radioactive materials license will shortly be sent requesting their approval to add you to our license as the Radiation Safety Officer (RSO)

As RSO, you are responsible for managing the radiation protection program; identifying radiation protection problems; initiating, recommending, or providing corrective actions; verifying implementation of corrective actions; stopping unsafe activities; and ensuring compliance with regulations.

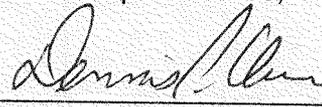
You are hereby delegated the authority necessary to meet those responsibilities, including prohibiting the use of radioactive material or radiation-generating equipment by employees who do not meet the necessary requirements.

You are required to notify management if staff do not cooperate and do not address radiation safety issues. In addition, you are free to raise issues with the U.S. Nuclear Regulatory Commission or the District of Columbia Department of Health at any time. It is estimated that you will spend an average of at least 40 hours per week conducting radiation protection activities.

Your signature below indicates that you accept the above responsibilities,



Emma F. Hooks, MA
AVP
Safety Management, Environmental Quality



Dennis P. Clum, CHP
Radiation Safety Officer

Dennis P. Clum, CHP

122 Hart Road
Gaithersburg, MD 20878
dennis.p.clum@gunet.georgetown.edu

Cell: (614) 561-7289

Work: (202) 444-4049

PROFESSIONAL SUMMARY

Dennis Clum is a member of the American Academy of Health Physics and is certified by the American Board of Health Physics. He has a Master's of Science degree with a concentration in Health Physics. He has over 24 years of professional radiation safety/ applied health physics experience and he has served as a radiation safety officer on three separate radioactive materials licenses for a period of over 10 years; and over four years as RSO on a hospital's medical institution radioactive materials license.

Experience includes a broad variety of radiation settings in the following environs: research laboratories, medical, university and a state agreement-state radiation protection bureau. He is experienced in restructuring and implementing improvements in radiological safety programs as was the case with Riverside Methodist Hospital, Ohio State University and Battelle Memorial Institute. At Riverside Hospital, he restructured the radiation safety program resulting in four Ohio Department of Health (ODH), Bureau of Radiation Protection inspections yielding zero inspection findings and zero items of concern. At OSU, he assisted the University RSO in restructuring a troubled radiation safety program that resulted in zero inspection findings over a period of four years. As the Battelle RSO, he inherited a dysfunctional radiation safety program that had received 201 audit findings the month before he was hired. All audit findings were corrected via a complete restructuring of the previous radiation safety program. And, U.S. NRC inspections resulted in one level three findings over three inspections occurring between 1992 and 1997.

He is currently the Radiation Safety Director and Laser Safety Officer for Georgetown University Hospital. Dennis has supervised the radiation safety office as the RSO for Riverside Methodist Hospital and as a Senior Health Physicist at the Ohio State University & Hospitals, a university possessing a Type A broad-scope medical license. He has served as a Health Physics Supervisor for the Bureau of Radiation Protection at the Ohio Department of Health (ODH).

Dennis is experienced in:

- Serving as a radiation safety officer on a Type A broad-scope research & development license and a limited-type medical radioactive materials license;
- supervising health physicists, health & safety specialists, emergency response personnel and radiation safety technicians;
- performing fetal dose calculations and radiological patient monitoring following treatment;

Dennis P. Clum, CHP

- serving on, and supervising, emergency preparedness/response teams and performing emergency dose calculations;
- performing annual radiation program assessments and reviews, and quality assurance procedures for medical settings;
- providing consultation to administration, management, faculty, research, medical, technical and ancillary staff;
- performing dose calibrator tests, internal dose assessments, radiation exposure calculations and x-ray shielding calculations and recommendations;
- developing and implementing Radiation Safety Programs, Emergency Preparedness Plans, Safe Operating Procedures, and Radiation Safety Manuals;
- developing and delivering radiation safety and emergency preparedness training sessions;
- performing formal radiological safety evaluations and risk assessments of proposed radiological operations and research;
- selecting, using proper radiological detection instrumentation and interpretation of analytical results, including but not limited to alpha and gamma spectroscopy;
- performing shielding-design calculations, internal/external dose modeling and assessments;
- conducting audits, inspections, and walkdowns and report writing for these activities;
- performing project-design and pre-construction design review;
- obtaining NRC and state licenses and amendments;
- interacting with various federal government agencies such as the U.S. EPA, FDA, FEMA, OSHA, NRC and various state agencies;
- representing his department and employer on various inter-agency committees;

EMPLOYMENT

Radiation Safety Director (8/17/2009 – present) for Georgetown University Hospital, 3800 Reservoir Road, Washington D.C 20878. License amendment to serve as Radiation Safety Officer has been submitted to the U.S. Nuclear Regulatory Commission for review. Dennis directs the radiation safety office staff consisting of a Deputy RSO/Medical Physicist and a Health Physics Technician.

Radiation Safety Officer (2004 – 2009) for Riverside Methodist Hospital, 3535 Olentangy River Road, Columbus, Ohio 43214. Served as Radiation Safety Officer and Radiation Committee Secretary for a medical institution license for categories 10CFR35 100, 200, 300, 400, 600 and 1000. Oversaw the dosimetry program and performed internal and external dosimetry calculations. Performed shielding design calculations and reports. Conducted training and audits in the areas of nuclear medicine, radiology, and radiation therapy. Revised the radiation safety and fluoroscopic safety training programs for physicians and staff. Implemented training for residents and Ancillary staff. Reviewed qualifications of individuals applying for Authorized User or Authorized Medical Physicist license privileges. Oversaw shipping and receiving of radioactive material. Oversaw security of material and emergency

Dennis P. Clum, CHP

response procedures. Reviewed relevant radiation safety regulation of the Ohio Administrative Code. Provided assistance with quality assurance testing for machine-produced diagnostic radiation.

Health Physicist Supervisor (2001-2004), for the Bureau of Radiation Protection, Ohio Department of Health, P.O. Box 118, 35 E. Chestnut Street, Columbus, Ohio 43216. Supervisor of six health physicists in the Radiological Assistance Section. Provide technical support including emergency dose calculations, inspections and evaluations, procedure development, record-keeping, training and radiological exercises. The Bureau administers and inspects radioactive material licenses under the U.S. NRC's Agreement State program and the inspecting of x-ray device registrations.

Senior Health Physicist at The Ohio State University and Medical Center; 1314 Kinnear Road, Columbus, Ohio 43212 (1997- 2001). Positions included serving as a health physicist and on a university & medical center broad-scope type A medical license that included biomedical research laboratories, hospitals, veterinary hospital and research nuclear reactor. Program Manager for the university's x -ray programs.

Health Physics Consultant through Dennis Clum and Associates, LLC., (1997-2001)
P.O. Box 3, Dublin, Ohio 43016;

Clients included:

- **Battelle Research Laboratories (1997-99, 2000-01)**, Columbus, Ohio
- **Sen Tek Corporation (2000-01)**, Columbus, Ohio 43232-5615.
- **Sharp & Associates, LLC. (1997 - 2001)**, Columbus, Ohio;
- **Industrial Research Measurements Systems, Inc. (1997-2000)**, Grove City, OH
Served as RSO on IRMS' radioactive material license from 1998-1999

Radiation Safety Officer and Assistant Radiological Manager (1992-1997) at Battelle Memorial Institute: 404 King Avenue, Columbus, Ohio 43201. RSO on a U.S. NRC Broad-scope license for a large-research facility located on two campuses. Promoted to Assistant Manager in 1994. Licensed activities included biomedical, agricultural, environmental, military, and pharmaceutical research.

CERTIFICATION AND LICENSURE

- **Diplomat and Certified Health Physicist** by the American Board of Health Physics (certified through 2012);
- **Certified Radiation Expert by the Ohio Department of Health:** Diagnostic (other than Mammography) and Mammography categories; certificate number 254 (2008-2010);
- **Certificate of License for Medical X-ray: District of Columbia:** number XY000208

Dennis P. Clum, CHP

EDUCATION

- **MS, Radiological Health Physics Concentration/Environmental Engineering Sciences:**
University of Florida, Gainesville, Florida;
- **BS, Computer and Mathematical Sciences with High Honors:**
Florida International University, University Park Campus, Miami Florida;

PROFESSIONAL ASSOCIATIONS

- Plenary Member of the Health Physics Society;
- Member of the American Academy of Health Physics;
- Former President/Executive Council Member of the Buckeye Chapter of the Health Physics Society;
- Full Member of the American Association of Physicists in Medicine.
- Full Member of the American College of Medical Physics,
- Served on Ohio's Utility Radiological Safety Board;
- Served on the Ohio's Low -Level Radioactive Waste Committee;
- Serving on the Board of the Ohio Association of Radon Professionals;
- Served on the Health Physics Society's 2010 Task Force, Membership and Public Information Committees.

TRAINING

U.S. NRC Radioactive Material Inspections Course (1 week), RSNA Categorical Courses in Diagnostic Physics and Radiation Safety (2005, 2007 & 2008), Annual Health Physics Symposium Professional Enrichment Classes (1987-2006), Annual American Board of Health Physics 8-hour Continuing Education Classes (1996-2006), ORISE Diagnostic Physics Review Course (1-week), MTMI's Computed Tomography for Physicists (Hands -on Workshop), MTMI's Mammography for Physicists, MTMI's MRI for Physicists (Hands -on Workshop), Digital Mammography, Fetal Radiological Dose Assessment, SEAAPM Optimization of Radiation Dose in Medical Settings Symposium, Internal Dosimetry Methodology, Health Physics Certification Review (2 weeks), FEMA's Radiological Emergency Response Course (1 week), FEMA's Advanced Radiological Emergency Response Operations Course (1 week), FEMA's Radiological Accident Dose Assessment Course (1 week) 40-hour HAZWOPER and HAZWOPER for Supervisors, IATA/IACO Dangerous Goods Transportation, Transportation of Radioactive and Hazardous Materials, Radioactive Waste, Radiation Safety Officer Training (1 week), Radiation Detection Instrumentation, Radon Testing and Mitigation Licensure Training, Radiation Shielding Computation Methodology, and Statistical Analysis.

Dennis P. Clum, CHP

SELECTED PRESENTATIONS and PUBLICATIONS

- “Radiation Safety Training for Nurses” and “New Employee Radiation Safety Training”, Georgetown University Hospital, 2009;
- “Initial and Refresher Radiation Safety Training”, Ohio Health, 2004-09;
- “Radiation Safety Training for Y -90 Sirspheres”, Ohio Health 2008;
- “Radiation Safety Training for Nuclear Medicine Staff”, Ohio Health, 2005-09
- “Radiation Safety Policy & Procedures Manual” revisions 7, 8 & 9, Ohio Health, 2006-2008;
- “Minimization and Optimization of CT Radiation Dose”, co-authored and co-presented, Ohio Health, 2007
- “Fluoroscopic Safety Training for Physicians”, Ohio Healthstream, Rev. 1 & 2, Ohio Health, 2005-09;
- “Fluoroscopic Safety Training for Staff”, Ohio Healthstream, Rev. 1 & 2, Ohio Health, 2005-09;
- Ohio State University Hospital Radiation Safety Training, 1998-2001;
- Ohio State University Research Staff Radiation Safety Training, 1998-2001;
- Ohio State University X-ray Safety Manual, 2nd Ed. (2001) and 1st Ed. (1998);
- Authored several Ohio State University Radiation Safety Procedures (1997 – 2001);
- “Emergency Response Radiation Safety Training” to Ohio Department of Health personnel, 2004 & 2005;
- “An Overview of the Proposed Radon in Drinking Water Legislation” to the Midwest Environmental Symposium, Columbus, Ohio, 2005;
- “Dirty Bomb Briefing Paper: for the State Director of Health and the Governor’s Cabinet, 2004;
- “An Overview of the Methodology and Implementation of Ohio’s Potassium Iodide (KI) Distribution Program to the General Public”; Annual Health Physics Society and American Radiation Safety Conference & Exposition, Washington, D.C. July 2004;
- “Ohio Policy on the Distribution of Potassium Iodide to the General Public”, April 2004
- “Radiological Emergency Preparedness in Ohio”, Ohio Homeland Security Symposium, 2003, Columbus, Ohio;
- “Overview of Ohio’s Radon Information Management System” 2003 U.S. EPA Region 5 Radon Conference, Columbus, Ohio;
- “Plume and Ingestion Phase Radiological Dose Assessment in Ohio” National Radiological Emergency Planners Annual Meeting, 2002, Milwaukee, Wisconsin;
- “Integrating Environmental Health and Safety Disciplines to Control Radiation, Chemical, and Safety Hazards Associated with a University Nuclear Reactor Pool Refurbishment Project”. Annual Health Physics Society and American Radiation Safety Conference & Exposition, 2001, Cleveland, Ohio;
- “Integration of Computer Data Management Between Approved Users, Principal Research Investigators and the Radiation Safety Office at the Ohio State University”. The American Radiation Safety Conference & Exposition, 2001, Cleveland, Ohio;
- “Internet Applications for the Health Physicist”, Co-author/presenter at the Buckeye Chapter of the Health Physics Society Meeting (1999), Columbus, Ohio;
- Authored or co-authored radiological safety and assessment procedures for Riverside Methodist Hospital, Ohio State University & Hospitals, Sen Tek Corporation, IRMS, Inc, Battelle Memorial Institute, Jacobs Engineering Group and the University of Florida (1988-2009).

American Board of Health Physics

Be it known that

Dennis P. Clum

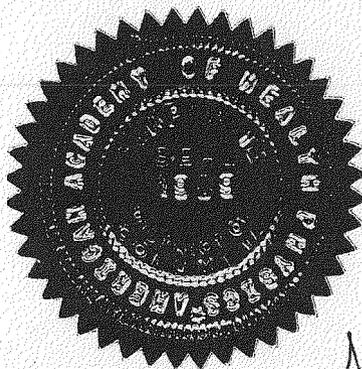
has satisfactorily met the professional standards established by the

American Board of Health Physics

and is hereby certified in
the comprehensive practice of

HEALTH PHYSICS

and is entitled to be identified as a Diplomate
of the American Board of Health Physics



Thomas L. Bull

Chairman

Frederic C. Brown

Vice-Chairman

[Signature]

Secretary-Treasurer

[Signature]

Chairman, Panel of Examiners

November 1996

Date

The University of Florida

has conferred on

Dennis Patrick Clum

the degree

Master of Science

and all the rights and privileges thereunto appertaining.

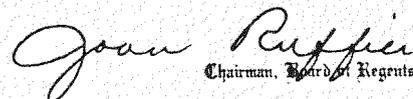
In Witness Whereof, this diploma, duly signed, has been issued and the seal of the University affixed.

Issued by the Board of Regents upon recommendation of the Faculty of

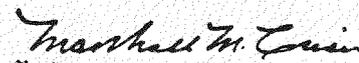
The Graduate School

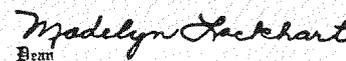
at Gainesville, this seventeenth day of December, A.D. 1988.


Governor


Chairman, Board of Regents




President


Dean

**RADIATION SAFETY OFFICER TRAINING AND EXPERIENCE
AND PRECEPTOR ATTESTATION
[10 CFR 35.50]**

APPROVED BY OMB: NO. 3150-0120
EXPIRES: 3/31/2012

Name of Proposed Radiation Safety Officer

Dennis P. Clum, CHP

Requested Authorization(s) *The license authorizes the following medical uses (check all that apply):*

- 35.100
 35.200
 35.300
 35.400
 35.500
 35.600 (remote afterloader)
 35.600 (teletherapy)
 35.600 (gamma stereotactic radiosurgery)
 35.1000 (Y90 Sirspheres)

**PART I -- TRAINING AND EXPERIENCE
(Select one of the four methods below)**

*Training and Experience, including board certification, must have been obtained within the 7 years preceding the date of application or the individual must have obtained related continuing education and experience since the required training and experience was completed. Provide dates, duration, and description of continuing education and experience related to the uses checked above.

1. Board Certification

- a. Provide a copy of the board certification.
- b. Use Table 3.c. to describe training in radiation safety, regulatory issues, and emergency procedures for all types of medical use on the license.
- c. Skip to and complete Part II Preceptor Attestation.

OR

2. Current Radiation Safety Officer Seeking Authorization to Be Recognized as a Radiation Safety Officer for the Additional Medical Uses Checked Above

- a. Use the table in section 3.c. to describe training in radiation safety, regulatory issues, and emergency procedures for the additional types of medical use for which recognition as RSO is sought.
- b. Skip to and complete Part II Preceptor Attestation.

OR

3. Structured Educational Program for Proposed Radiation Safety Officer

a. Classroom and Laboratory Training

Description of Training	Location of Training	Clock Hours	Dates of Training*
Radiation physics and instrumentation	University of Florida	64	1985-1988
	Annual HPS & RSNA Meetings	32	2004-2008
	ORAU Diagnostic Physics Class	40	2006
Radiation protection	University of Florida	32	1985-1988
	Annual HPS & RSNA Meetings	16	2004-2008
Mathematics pertaining to the use and measurement of radioactivity	University of Florida	64	1985-1988
	CHP Part I & II Review Classes	16	1994 & 1996
	ORAU Diagnostic Physics Class	8	2006
Radiation biology	University of Florida	32	1985-1988
	Annual HPS & RSNA Meetings	16	2004-2008
	Annual NCRP Meeting	16	2005-2008
Radiation dosimetry	University of Florida	32	1985-1988
	Ohio State University	30	2001
	Annual HPS & RSNA Meetings	16	2005-2008
Total Hours of Training:			

RADIATION SAFETY OFFICER TRAINING AND EXPERIENCE AND PRECEPTOR ATTESTATION (continued)

3. Structured Educational Program for Proposed Radiation Safety Officer (continued)

b. Supervised Radiation Safety Experience (continued)

(If more than one supervising individual is necessary to document supervised work experience, provide multiple copies of this section.)

Supervising Individual John Baumert, MD	License/Permit Number listing supervising individual as a Radiation Safety Officer Ohio #021202050700
This license authorizes the following medical uses:	
<input checked="" type="checkbox"/> 35.100	<input checked="" type="checkbox"/> 35.200
<input checked="" type="checkbox"/> 35.300	<input type="checkbox"/> 35.400
<input type="checkbox"/> 35.500	<input type="checkbox"/> 35.600 (remote afterloader)
<input type="checkbox"/> 35.600 (gamma stereotactic radiosurgery)	<input type="checkbox"/> 35.600 (teletherapy)
	<input type="checkbox"/> 35.1000 (_____)

c. Describe training in radiation safety, regulatory issues, and emergency procedures for all types of medical use on the license.

Description of Training	Training Provided By	Dates of Training*
Radiation safety, regulatory issues, and emergency procedures for 35.100, 35.200, and 35.500 uses	John Baumert, MD	2004-2008
Radiation safety, regulatory issues, and emergency procedures for 35.300 uses	John Baumert, MD	2004-2008
Radiation safety, regulatory issues, and emergency procedures for 35.400 uses		
Radiation safety, regulatory issues, and emergency procedures for 35.600 - teletherapy uses		
Radiation safety, regulatory issues, and emergency procedures for 35.600 - remote afterloader uses		
Radiation safety, regulatory issues, and emergency procedures for 35.600 - gamma stereotactic radiosurgery uses		
Radiation safety, regulatory issues, and emergency procedures for 35.1000, specify use(s):		

RADIATION SAFETY OFFICER TRAINING AND EXPERIENCE AND PRECEPTOR ATTESTATION (continued)

3. Structured Educational Program for Proposed Radiation Safety Officer (continued)

b. Supervised Radiation Safety Experience (continued)

(If more than one supervising individual is necessary to document supervised work experience, provide multiple copies of this section.)

Supervising Individual Raymond Wu, PH.D., DABR	License/Permit Number listing supervising individual as a Radiation Safety Officer Ohio, #02120250070
This license authorizes the following medical uses:	
<input type="checkbox"/> 35.100	<input type="checkbox"/> 35.200
<input type="checkbox"/> 35.300	<input checked="" type="checkbox"/> 35.400
<input type="checkbox"/> 35.500	<input checked="" type="checkbox"/> 35.600 (remote afterloader)
<input type="checkbox"/> 35.600 (gamma stereotactic radiosurgery)	<input type="checkbox"/> 35.600 (teletherapy)
	<input type="checkbox"/> 35.1000 (_____)

c. Describe training in radiation safety, regulatory issues, and emergency procedures for all types of medical use on the license.

Description of Training	Training Provided By	Dates of Training*
Radiation safety, regulatory issues, and emergency procedures for 35.100, 35.200, and 35.500 uses		
Radiation safety, regulatory issues, and emergency procedures for 35.300 uses		
Radiation safety, regulatory issues, and emergency procedures for 35.400 uses	Raymond Wu	2004-2008
Radiation safety, regulatory issues, and emergency procedures for 35.600 - teletherapy uses		
Radiation safety, regulatory issues, and emergency procedures for 35.600 - remote afterloader uses	Raymond Wu	2004-2008
Radiation safety, regulatory issues, and emergency procedures for 35.600 - gamma stereotactic radiosurgery uses		
Radiation safety, regulatory issues, and emergency procedures for 35.1000, specify use(s):		

RADIATION SAFETY OFFICER TRAINING AND EXPERIENCE AND PRECEPTOR ATTESTATION (continued)

3. Structured Educational Program for Proposed Radiation Safety Officer (continued)

b. Supervised Radiation Safety Experience (continued)

(If more than one supervising individual is necessary to document supervised work experience, provide multiple copies of this section.)

Supervising Individual Balbir Rechal, Ph.D., DABR	License/Permit Number listing supervising individual as a Radiation Safety Officer Ohio License #02120250025
This license authorizes the following medical uses:	
<input type="checkbox"/> 35.100 <input type="checkbox"/> 35.200 <input type="checkbox"/> 35.300	<input checked="" type="checkbox"/> 35.400
<input type="checkbox"/> 35.500 <input type="checkbox"/> 35.600 (remote afterloader)	<input checked="" type="checkbox"/> 35.600 (teletherapy)
<input type="checkbox"/> 35.600 (gamma stereotactic radiosurgery)	<input type="checkbox"/> 35.1000 (_____)

c. Describe training in radiation safety, regulatory issues, and emergency procedures for all types of medical use on the license.

Description of Training	Training Provided By	Dates of Training*
Radiation safety, regulatory issues, and emergency procedures for 35.100, 35.200, and 35.500 uses		
Radiation safety, regulatory issues, and emergency procedures for 35.300 uses		
Radiation safety, regulatory issues, and emergency procedures for 35.400 uses	Balbir Rechal	2004-2007
Radiation safety, regulatory issues, and emergency procedures for 35.600 - teletherapy uses		
Radiation safety, regulatory issues, and emergency procedures for 35.600 - remote afterloader uses	Balbir Rechal	2004-2007
Radiation safety, regulatory issues, and emergency procedures for 35.600 - gamma stereotactic radiosurgery uses		
Radiation safety, regulatory issues, and emergency procedures for 35.1000, specify use(s):		

RADIATION SAFETY OFFICER TRAINING AND EXPERIENCE AND PRECEPTOR ATTESTATION (continued)

3. Structured Educational Program for Proposed Radiation Safety Officer (continued)

b. Supervised Radiation Safety Experience (continued)

(If more than one supervising individual is necessary to document supervised work experience, provide multiple copies of this section.)

Supervising Individual Joseph Saldarini	License/Permit Number listing supervising individual as a Radiation Safety Officer <p style="text-align: center;">Ohio #021202050070</p>
This license authorizes the following medical uses: <input type="checkbox"/> 35.100 <input type="checkbox"/> 35.200 <input type="checkbox"/> 35.300 <input type="checkbox"/> 35.400 <input type="checkbox"/> 35.500 <input type="checkbox"/> 35.600 (remote afterloader) <input type="checkbox"/> 35.600 (teletherapy) <input type="checkbox"/> 35.600 (gamma stereotactic radiosurgery) <input checked="" type="checkbox"/> 35.1000 (<u>Y90 Sirspheres</u>)	

c. Describe training in radiation safety, regulatory issues, and emergency procedures for all types of medical use on the license.

Description of Training	Training Provided By	Dates of Training*
Radiation safety, regulatory issues, and emergency procedures for 35.100, 35.200, and 35.500 uses		
Radiation safety, regulatory issues, and emergency procedures for 35.300 uses		
Radiation safety, regulatory issues, and emergency procedures for 35.400 uses		
Radiation safety, regulatory issues, and emergency procedures for 35.600 - teletherapy uses		
Radiation safety, regulatory issues, and emergency procedures for 35.600 - remote afterloader uses		
Radiation safety, regulatory issues, and emergency procedures for 35.600 - gamma stereotactic radiosurgery uses		
Radiation safety, regulatory issues, and emergency procedures for 35.1000, specify use(s):	Joseph Saldarini	May 2008 - April 2009

RADIATION SAFETY OFFICER TRAINING AND EXPERIENCE AND PRECEPTOR ATTESTATION (continued)

3. Structured Educational Program for Proposed Radiation Safety Officer (continued)

b. Supervised Radiation Safety Experience (continued)

(If more than one supervising individual is necessary to document supervised work experience, provide multiple copies of this section.)

Supervising Individual Auroba Al-Samarace	License/Permit Number listing supervising individual as a Radiation Safety Officer NRC # 08-30577-01
This license authorizes the following medical uses:	
<input type="checkbox"/> 35.100	<input type="checkbox"/> 35.200
<input type="checkbox"/> 35.500	<input type="checkbox"/> 35.300
<input type="checkbox"/> 35.600 (gamma stereotactic radiosurgery)	<input type="checkbox"/> 35.400
	<input type="checkbox"/> 35.600 (teletherapy)
	<input checked="" type="checkbox"/> 35.1000 (<u>Y90 Sirspheres</u>)

c. Describe training in radiation safety, regulatory issues, and emergency procedures for all types of medical use on the license.

Description of Training	Training Provided By	Dates of Training*
Radiation safety, regulatory issues, and emergency procedures for 35.100, 35.200, and 35.500 uses		
Radiation safety, regulatory issues, and emergency procedures for 35.300 uses		
Radiation safety, regulatory issues, and emergency procedures for 35.400 uses		
Radiation safety, regulatory issues, and emergency procedures for 35.600 - teletherapy uses		
Radiation safety, regulatory issues, and emergency procedures for 35.600 - remote afterloader uses		
Radiation safety, regulatory issues, and emergency procedures for 35.600 - gamma stereotactic radiosurgery uses		
Radiation safety, regulatory issues, and emergency procedures for 35.1000, specify use(s):	Auroba Al-Samarace	July 2009

RADIATION SAFETY OFFICER TRAINING AND EXPERIENCE AND PRECEPTOR ATTESTATION (continued)

3. Structured Educational Program for Proposed Radiation Safety Officer (continued)

c. Training in radiation safety, regulatory issues, and emergency procedures for all types of medical use on the license (continued)

<p>Supervising Individual <i>If training was provided by supervising RSO, AU, AMP, or ANP. (If more than one supervising individual is necessary to document supervised training, provide multiple copies of this page.)</i></p> <p>Dennis P. Clum, CHP</p>	<p>License/Permit Number listing supervising individual</p> <p style="text-align: center;">Ohio Department of Health # 02120250070</p>
<p>License/Permit lists supervising individual as:</p> <p> <input checked="" type="checkbox"/> Radiation Safety Officer <input type="checkbox"/> Authorized User <input type="checkbox"/> Authorized Nuclear Pharmacist <input type="checkbox"/> Authorized Medical Physicist </p> <p>Authorized as RSO, AU, ANP, or AMP for the following medical uses:</p> <p> <input checked="" type="checkbox"/> 35.100 <input checked="" type="checkbox"/> 35.200 <input checked="" type="checkbox"/> 35.300 <input checked="" type="checkbox"/> 35.400 <input type="checkbox"/> 35.500 <input checked="" type="checkbox"/> 35.600 (remote afterloader) <input type="checkbox"/> 35.600 (teletherapy) <input type="checkbox"/> 35.600 (gamma stereotactic radiosurgery) <input checked="" type="checkbox"/> 35.1000 (Y-90 Sirspheres) </p>	

d. Skip to and complete Part II Preceptor Attestation.

OR

4. Authorized User, Authorized Medical Physicist, or Authorized Nuclear Pharmacist identified on the licensee's license

- a. Provide license number.
- b. Use the table in section 3.c. to describe training in radiation safety, regulatory issues, and emergency procedures for all types of medical use on the license.
- c. Skip to and complete Part II Preceptor Attestation.

PART II – PRECEPTOR ATTESTATION

Note: This part must be completed by the individual's preceptor. The preceptor does not have to be the supervising individual as long as the preceptor provides, directs, or verifies training and experience required. If more than one preceptor is necessary to document experience, obtain a separate preceptor statement from each.

First Section

Check one of the following:

1. Board Certification

I attest that _____ has satisfactorily completed the requirements in
Name of Proposed Radiation Safety Officer
 10 CFR 35.50(a)(1)(i) and (a)(1)(ii); or 35.50 (a)(2)(i) and (a)(2)(ii); or 35.50(c)(1).

OR

2. Structured Educational Program for Proposed Radiation Safety Officers

I attest that **Denni P. Clum, CHP** has satisfactorily completed a structural educational
Name of Proposed Radiation Safety Officer
 program consisting of both 200 hours of classroom and laboratory training and one year of full-time radiation safety experience as required by 10 CFR 35.50(b)(1).

OR

RADIATION SAFETY OFFICER TRAINING AND EXPERIENCE AND PRECEPTOR ATTESTATION (continued)

Preceptor Attestation (continued)

First Section (continued)

Check one of the following:

3. Additional Authorization as Radiation Safety Officer

I attest that Dennis P. Clum, CHP is an Radiation Safety Officer
Name of Proposed Radiation Safety Officer

Authorized User

Authorized Nuclear Pharmacist

Authorized Medical Physicist

identified on the Licensees license and has experience with the radiation safety aspects of similar type of use of byproduct material for which the individual has Radiation Safety Officer responsibilities

AND

Second Section

Complete for all (check all that apply):

I attest that Dennis P. Clum, CHP has training in the radiation safety, regulatory issues, and
Name of Proposed Radiation Safety Officer

emergency procedures for the following types of use:

35.100

35.200

35.300 oral administration of less than or equal to 33 millicuries of sodium iodide I-131, for which a written directive is required

35.300 oral administration of greater than 33 millicuries of sodium iodide I-131

35.300 parenteral administration of any beta-emitter, or a photon-emitting radionuclide with a photon energy less than 150 keV for which a written directive is required

35.300 parenteral administration of any other radionuclide for which a written directive is required

35.400

35.500

35.600 remote afterloader units

35.600 teletherapy units

35.600 gamma stereotactic radiosurgery units

35.1000 emerging technologies, including:
Y-90 Spheres

RADIATION SAFETY OFFICER TRAINING AND EXPERIENCE AND PRECEPTOR ATTESTATION (continued)

AND

**Third Section
Complete for ALL**

I attest that Dennis P. Clum, CHP has achieved a level of radiation safety knowledge
Name of Proposed Radiation Safety Officer
sufficient to function independently as a Radiation Safety Officer for a medical use licensee.

**Fourth Section
Complete the following for Preceptor Attestation and signature**

I am the Radiation Safety Officer for Grant/Riverside Medical Center
Name of Facility

License/Permit Number: Ohio Department of Health, # 021210250037

Name of Preceptor	Signature	Telephone Number	Date
Balbir Rechal, Ph.D., DABR		(614) 566-5705	8-8-09

OHIO DEPARTMENT OF HEALTH LICENSE FOR RADIOACTIVE MATERIAL

Pursuant to Chapter 3748 of the Ohio Revised Code, and in reliance on statements and representations made by the licensee, a license is hereby issued authorizing the licensee named herein to receive, acquire, possess, and transfer radioactive material as 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 applications of Chapter 3748 of the Ohio Revised Code and all applicable rules promulgated thereunder. This license is subject to all applicable rules, regulations and orders of the Ohio Department of Health now or hereinafter in effect and to any conditions specified below.

LICENSEE 1. Riverside Methodist Hospital 2. 3535 Olentangy River Road Columbus OH 43214	LICENSE NUMBER 3. 02120250070 <hr/> EXPIRATION DATE 4. September 1, 2010 <hr/> BUREAU DOCKET NUMBER 5. 501024-1839
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6. RADIOACTIVE MATERIAL A. Any radioactive material permitted by rule 3701:1-58-32 of the Ohio Administrative Code B. Any radioactive material permitted by rule 3701:1-58-34 of the Ohio Administrative Code C. Any radioactive material permitted by rule 3701:1-58-37 of the Ohio Administrative Code D. Any radioactive material permitted by rule 3701:1-58-43 of the Ohio Administrative Code E. Any radioactive material permitted by rule 3701:1-58-53 of the Ohio Administrative Code F. Any radioactive material permitted by rule 3701:1-46-11 of the Ohio Administrative Code G. Iridium - 192 permitted by rule 3701:1-58-55 of the Ohio Administrative Code H. Cesium - 137 permitted by rule 3701:1-58-55 of the Ohio Administrative Code	7. CHEMICAL AND/OR PHYSICAL FORM A. Any radiopharmaceutical form B. Any radiopharmaceutical form C. Any radiopharmaceutical form D. Any brachytherapy sealed sources E. Any sealed source F. Prepackaged kits G. Sealed Sources (Nucletron Model 105.002) H. Sealed Source (Amersham Corp. Model CDC.SP1)	8. MAXIMUM QUANTITY THAT LICENSEE MAY POSSESS AT ANY ONE TIME UNDER THIS LICENSE A. As Needed, not to exceed 3.7 GBq (100 mCi) Cobalt-57 B. As Needed C. As Needed D. As Needed E. As Needed F. As Needed G. Two sources not to exceed 795.5 GBq (21.5 Ci) total in one location, one source not to exceed 481 GBq (13 Ci) H. 40.7 GBq (1.1 Ci), no single source to exceed 740 MBq (20 mCi)
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OHIO DEPARTMENT OF HEALTH LICENSE FOR RADIOACTIVE MATERIALS SUPPLEMENTARY SHEET	Page 2 of 5
	License Number: 02120250070
	Bureau Docket Number: 501024-1839
	Amendment No.: 32

- | 6. RADIOACTIVE MATERIAL | 7. CHEMICAL AND/OR PHYSICAL FORM | 8. MAXIMUM QUANTITY THAT LICENSEE MAY POSSESS AT ANY ONE TIME UNDER THIS LICENSE |
|--|---|--|
| I. Strontium-90 permitted by rule 3701:1-58-72 of the Ohio Administrative Code | I. Sealed sources. (BEBIG Model Sr0.S03 or AEAT Technology Model SICW Series) | I. 30 GBq (800 mCi) total. Not to exceed 185 MBq (5.0 mCi) per source. |
| J. Uranium depleted in U-235 | J. For use as shielding for generators | J. 999 kilograms |
| K. Strontium - 90 | K. Sealed source, special form Radiochemical Center Model SIC-7 | K. One source, not to exceed 370 MBq (10 mCi) |
| L. Cobalt - 57 | L. Sealed Source (DuPont NES- or equivalent) | L. As needed. No single source to exceed 925 MBq (25 mCi) |
| M. Yttrium-90 | M. Any form | M. 18.5 GBq (500 mCi) |
| N. Yttrium-90 permitted by rule 3701:1-58-72 of the Ohio Administrative Code | N. Sealed sources (SirSphere or equivalent) Y-90 microspheres | N. 92.5 GBq (2.5 Ci) |

9. Authorized Uses
- A. Any uptake, dilution and excretion study permitted by rule 3701:1-58-32 of the Ohio Administrative Code.
 - B. Any imaging and localization study permitted by rule 3701:1-58-34 of the Ohio Administrative Code.
 - C. Any medical use permitted by rule 3701:1-58-37 of the Ohio Administrative Code.
 - D. Any brachytherapy sources for therapeutic medical use permitted by rule 3701:1-58-43 of the Ohio Administrative Code.
 - E. Any sealed source for diagnostic medial use permitted by rule 3701:1-58-53 of the Ohio Administrative Code.
 - F. In Vitro studies permitted by rule 3701:1-46-11 of the Ohio Administrative Code.
 - G. One sealed source for therapeutic use permitted by rule 3701:1-58-55 of the Ohio Administrative Code, in a Nucletron microSelectron HDR remote afterloader unit, model 105.999. The source activity shall not exceed shall not exceed 444 GBq (12 Ci) at the time of installation. One sealed source in its shipping container for replacement in the remote afterloader unit.
 - H. One sealed source for therapeutic use permitted by rule 3701:1-58-55 of the Ohio Administrative Code, in a Nucletron Selectron-LDR remote afterloading device unit.
 - I. For use in Novoste A1000 series models for intravascular brachytherapy as permitted by rule 3701:1-58-72 of the Ohio Administrative Code.
 - J. For use as shielding for generators.
 - K. - L. Check, calibration and reference sources.
 - M. Calibration and reference source for Y-90 Zevalin use.
 - N. For manual permanent brachytherapy implantation therapy as permitted by rule 3701:1-58-72 of the Ohio Administrative Code using SIR-Sphere Yttrium-90 microspheres and delivery system.

OHIO DEPARTMENT OF HEALTH LICENSE FOR RADIOACTIVE MATERIALS SUPPLEMENTARY SHEET	Page <u>3</u> of <u>5</u>
	License Number: 02120250070
	Bureau Docket Number: 501024-1839
	Amendment No.: 32

CONDITIONS

10. Licensed material may only be used at the licensee's facilities located at:
- | | |
|---|---|
| A. Riverside Methodist Hospital Campus
3535 Olentangy River Road
Columbus Ohio 43214 | B. American Kidney Stone Management
797 Thomas Lane
Columbus, Ohio 43214 |
|---|---|

11. The Radiation Safety Officer for this license is:

Dennis P. Clum, M.S., CHP

12. Licensed material is only authorized for use by, or under the supervision of:
1. Individuals permitted to work as an authorized user, authorized nuclear pharmacist, and / or authorized medical physicist in accordance with rule 3701:1-58-08 and 3701:1-58-09 of the Ohio Administrative Code.
 2. The following individuals are authorized users for the material and medical uses indicated:

Authorized Users	Material and Uses
A. Mark Becker, M.D.	A. Uses permitted by rules 3701:1-58-37, 3701:1-58-43, 3701:1-58-55 (Iridium-192 in a High Dose rate Afterloader Unit and Cesium-137 in a Low Dose Rate Afterloader Unit), 3701:1-58-72 (Strontium-90 for intravascular brachytherapy), and 3701:1-46-11 of the Ohio Administrative Code
B. Lawrence B. Berk, M.D., Ph.D.	B. Uses permitted by rules 3701:1-58-43, 3701:1-58-55 (Iridium-192 in a High Dose rate Afterloader Unit and Cesium-137 in a Low Dose Rate Afterloader Unit), and 3701:1-58-72 (Strontium-90 for intravascular brachytherapy) of the Ohio Administrative Code
C. Chuck. C. Cho, M.D.	C. Uses permitted by rules 3701:1-58-37, 3701:1-58-43, 3701:1-58-55 (Iridium-192 in a High Dose rate Afterloader Unit and Cesium-137 in a Low Dose Rate Afterloader Unit), 3701:1-58-72 (Strontium-90 for intravascular brachytherapy), and 3701:1-46-11 of the Ohio Administrative Code
D. Daryl Ann Cottrell, M.D.	D. Uses permitted by rule 3701:1-58-32 and Iodine-131 as permitted by rule 3701:1-58-37 of the Ohio Administrative Code
E. Mark J. Crnkovich, M.D.	E. Uses permitted by rules 3701:1-58-43, 3701:1-58-37 excluding Iodine-131, 3701:1-58-55 (Iridium-192 in a High Dose rate Afterloader Unit) and Cesium-137 in a Low Dose Rate Afterloader Unit), and 3701:1-58-72 (Strontium-90 for intravascular brachytherapy) of the Ohio Administrative Code
F. Praveen Dubey, M.D.	F. Uses permitted by rules 3701:1-58-43, 3701:1-58-37 except Iodine-131, 3701:1-58-55 (Iridium-192 in a High Dose rate Afterloader Unit and Cesium-137 in a Low Dose Rate Afterloader Unit), and 3701:1-58-72 (Strontium-90 for intravascular brachytherapy) of the Ohio Administrative Code
G. Thomas J. Pedrick, M.D.	G. Uses permitted by rules 3701:1-58-43, 3701:1-58-37 except Iodine-131, 3701:1-58-55 (Iridium-192 in a High Dose rate Afterloader Unit and Cesium-137 in a Low Dose Rate Afterloader Unit), and 3701:1-58-72 (Strontium-90 for intravascular brachytherapy) of the Ohio Administrative Code

OHIO DEPARTMENT OF HEALTH LICENSE FOR RADIOACTIVE MATERIALS SUPPLEMENTARY SHEET	Page 4 of 5
	License Number: 02120250070
	Bureau Docket Number: 501024-1839
	Amendment No.: 32

H. Jason E. Seavolt, M.D.

I. Phillip B. Shaffer, M.D.

J. Sherif F. Yacoub, M.D., Ph.D.

K. Steven Albert Young, M.D.

L. David P. Zadvinskis, M.D.

3. The following individuals are authorized medical physicists:

Authorized Medical Physicists

Material and Uses

A. Brent J. Albertson, M.S.

B. Christie Harris, DABR

C. Haejin Kang, Ph.D.

D. Raymond Kee - Kin Wu, Ph.D.

E. Paul Lundahl, DABR

F. Surender Rao, M.S.

G. Balbir Reehal, Ph.D., DABR

H. Alan Wong, M.S.

H. Uses permitted by rules 3701:1-58-43, 3701:1-58-37 except Iodine-131, 3701:1-58-55 (Iridium-192 in a High Dose rate Afterloader Unit and Cesium-137 in a Low Dose Rate Afterloader Unit), and 3701:1-58-72 (Strontium-90 for intravascular brachytherapy) of the Ohio Administrative Code

I. Uses permitted by rules 3701:1-58-32, 3701:1-58-34, 3701:1-58-37, 3701:1-58-53, and 3701:1-46-11 of the Ohio Administrative Code

J. Uses permitted by rules 3701:1-58-43, 3701:1-58-55 (Iridium-192 in a High Dose rate Afterloader Unit and Cesium-137 in a Low Dose Rate Afterloader Unit), and 3701:1-58-72 (Strontium-90 for intravascular brachytherapy) of the Ohio Administrative Code

K. Uses permitted by rules 3701:1-58-32, 3701:1-58-34, 3701:1-58-37, 3701:1-58-53, and 3701:1-46-11 of the Ohio Administrative Code

L. Uses permitted by rules 3701:1-58-32, 3701:1-58-34, 3701:1-58-37, 3701:1-58-53, and 3701:1-46-11 of the Ohio Administrative Code

A. Strontium-90 for intravascular brachytherapy, Iridium-192 for use in a High Dose Rate Remote Afterloader Unit, and Cesium-137 for use in a Low Dose Rate Remote Afterloader Unit.

B. Strontium-90 for intravascular brachytherapy, Iridium-192 for use in a High Dose Rate Remote Afterloader Unit, and Cesium-137 for use in a Low Dose Rate Remote Afterloader Unit.

C. Strontium-90 for intravascular brachytherapy, Iridium-192 for use in a High Dose Rate Remote Afterloader Unit, and Cesium-137 for use in a Low Dose Rate Remote Afterloader Unit.

D. Strontium-90 for intravascular brachytherapy, Iridium-192 for use in a High Dose Rate Remote Afterloader Unit, and Cesium-137 for use in a Low Dose Rate Remote Afterloader Unit.

E. Strontium-90 for intravascular brachytherapy, Iridium-192 for use in a High Dose Rate Remote Afterloader Unit, and Cesium-137 for use in a Low Dose Rate Remote Afterloader Unit.

F. Strontium-90 for intravascular brachytherapy, Iridium-192 for use in a High Dose Rate Remote Afterloader Unit, and Cesium-137 for use in a Low Dose Rate Remote Afterloader Unit.

G. Strontium-90 for intravascular brachytherapy, Iridium-192 for use in a High Dose Rate Remote Afterloader Unit, and Cesium-137 for use in a Low Dose Rate Remote Afterloader Unit.

H. Strontium-90 for intravascular brachytherapy, Iridium-192 for use in a High Dose Rate Remote Afterloader Unit, and Cesium-137 for use in a Low Dose Rate Remote Afterloader Unit.

13. All sealed sources that are used or obtained shall have been evaluated and approved under the provisions of rule 3701:1-46-49 of the Ohio Administrative Code, or by equivalent NRC, Agreement State, or NARM licensing state regulation.

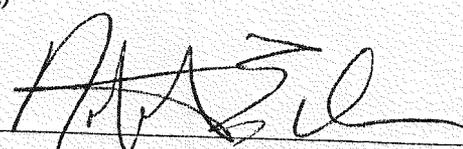
OHIO DEPARTMENT OF HEALTH LICENSE FOR RADIOACTIVE MATERIALS SUPPLEMENTARY SHEET	Page <u>5</u> of <u>5</u>
	License Number: 02120250070
	Bureau Docket Number: 501024-1839
	Amendment No.: 32

14. All persons performing activities meeting the definition of "Nuclear Medicine Technologist" as specified in R.C. 4773.01 shall be licensed and in good standing with the state of Ohio.
15. Pursuant to 10 CFR 40, "Domestic Licensing of Source Material," as delineated in rule 3701-39-02.1 of the Ohio Administrative Code, the licensee is authorized to possess, use, transfer, and import up to 999 kilograms of depleted uranium contained as shielding material in the molybdenum-99/technetium-99m generators authorized by this license.
16. Licensee shall maintain records regarding safe and effective decommissioning information at 3535 Olentangy River Road, Columbus, Ohio per the provisions of rule 3701:1-40-17(I) of the Ohio Administrative Code until the Department terminates this license.
17. The licensee is authorized to transport licensed material only in accordance with Chapter 3701:1-50 of the Ohio Administrative Code.
18. In addition to the possession limits in Item 8, the licensee shall further restrict the possession of sealed source licensed material to quantities below the minimum limit specified in rule 3701:1-40-17(B) of the Ohio Administrative Code for establishing decommissioning financial assurance.
19. In addition to the requirements in rule 3701:1-58-30 of the Ohio Administrative Code any patient administered gamma emitting radiopharmaceuticals or permanent brachytherapy sources shall be provided a patient release card to include:
 - (1) The patient's name.
 - (2) The radionuclide administered and its activity.
 - (3) The facility name which administered the radionuclide.
 - (4) The date of the administration of the radionuclide.
 - (5) The expiration date of the card.

The card is not applicable to those patients who are institutionalized (Hospitals, Nursing Homes, Correctional Institutions, etc.) or whose radiation levels do not exceed 0.1 mR/hr at one meter.
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 Ohio Department of Health's regulations shall govern unless the statements, representations, and procedures in the licensee's application and correspondence are more restrictive than the regulations.
 - A. Renewal application dated May 26, 2005 and correspondence dated June 14, 2005, June 28, 2005, October 3, 2005, October 11, 2005, October 18, 2005 and October 28, 2005.
 - B. Amendment 25 of License #02120250070; renewed in its entirety.
 - C. Amendment to convert to Chapter 3701:1-58 of the Ohio Administrative Code (Amendment 26).
 - D. Letter dated November 21, 2005 (Amendment #27)
 - E. Letter dated December 31, 2006 (Amendment #28)
 - F. Director's Order dated April 21, 2006 (Amendment #29)
 - G. Letter dated July 25, 2006 (Amendment #30)
 - H. Letter dated March 12, 2007 (Amendment #31)
 - I. Letter dated February 15, 2008 (Amendment #32)

For the Ohio Department of Health

DATE: 3/12/08

BY: 
 Robert E. Owen, Chief Bureau of Radiation Protection
 on behalf of Director of Health

**OHIO DEPARTMENT OF HEALTH
LICENSE FOR RADIOACTIVE MATERIAL**

Pursuant to Chapter 3748 of the Ohio Revised Code, and in reliance on statements and representations made by the licensee, a license is hereby issued authorizing the licensee named herein to receive, acquire, possess, and transfer radioactive material as 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 applications of Chapter 3748 of the Ohio Revised Code and all applicable rules promulgated there under. This license is subject to all applicable rules, regulations and orders of the Ohio Department of Health now or hereinafter in effect and to any conditions specified below.

LICENSEE	LICENSE NUMBER
1. The Ohio State University	3. 02110250037
2. Office of Environmental Health and Safety 1314 Kinnear Road Columbus, Ohio 43212-1168	EXPIRATION DATE
	4. July 1, 2012
	FILE NUMBER / ID NUMBER
	5. 501167 / 3047

<p>6. RADIOACTIVE MATERIAL</p> <p>A. Any radioactive material permitted by rule 3701:1-58-32 of the Ohio Administrative Code.</p> <p>B. Any radioactive material permitted by rule 3701:1-58-34 of the Ohio Administrative Code</p> <p>C. Any radioactive material permitted by rule 3701:1-58-37 of the Ohio Administrative Code</p> <p>D. Any radioactive material permitted by rule 3701:1-58-43 of the Ohio Administrative Code</p> <p>E. Any radioactive material permitted by rule 3701:1-58-53 of the Ohio Administrative Code</p> <p>F. Iridium-192 permitted by rule 3701:1-58-55 of the Ohio Administrative Code</p> <p>G. Cobalt-60 permitted by rule 3701:1-58-55 of the Ohio Administrative Code</p>	<p>7. CHEMICAL AND/OR PHYSICAL FORM</p> <p>A. Any radiopharmaceutical form</p> <p>B. Any radiopharmaceutical form</p> <p>C. Any radiopharmaceutical form</p> <p>D. Sealed Sources</p> <p>E. Sealed Sources</p> <p>F. Sealed Source (Gamma Med Model 232 or equivalent)</p> <p>G. Sealed sources (MDS Nordion - Elektra Model Nos. 43047 and/or 43685)</p>	<p>8. MAXIMUM QUANTITY THAT LICENSEE MAY POSSESS AT ANY ONE TIME UNDER THIS LICENSE</p> <p>A. As needed</p> <p>B. As needed</p> <p>C. 74 GBq (2 Ci)</p> <p>D. 795 GBq (21.5 Ci)</p> <p>E. 185 GBq (5.0 Ci)</p> <p>F. 795.5 GBq (21.5 Ci) in two sources, no single source to exceed 555 GBq (15 Ci)</p> <p>G. 518 TBq (14 kCi) in 402 sources, no single source to exceed 1.3 TBq (36 Ci) each</p>
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LICENSE FOR RADIOACTIVE MATERIALS

License Number 02110250037

SUPPLEMENTARY SHEET

File Number / ID Number: 501167 / 3047

Amendment No. 26

6. RADIOACTIVE MATERIAL

H. Any radioactive material, with atomic number 1 to 83, inclusive

I. Hydrogen-3

J. Hydrogen-3

K. Nickel-63

L. Krypton-85

M. Hydrogen-3

N. Cesium-137

O. Cesium-137

P. Americium-241

Q. Thorium

R. Uranium (natural or depleted in Uranium-235)

S. Plutonium-239

7. CHEMICAL AND/OR PHYSICAL FORM

H. Any

I. Sealed source in an electron-capture device which has been registered per rule 3701:1-46-49 Ohio Administrative Code, NRC, an Agreement State, or NARM Licensing State

J. Sealed source (scandium-, titanium-, or zirconium-tritide)

K. Sealed source in an electron-capture device

L. Sealed source

M. Target for Thermo Electron Model MP 320 Neutron Generator composed of zirconium, titanium, or scandium impregnated with Hydrogen-3.

N. Sealed source (Victoreen Model 28-6A)

O. Sealed source

P. Sealed source

Q. Any

R. Any

S. Electroplated source

8. MAXIMUM QUANTITY THAT LICENSEE MAY POSSESS AT ANY ONE TIME UNDER THIS LICENSE

H. 14.8 TBq (400 Ci), no single radionuclide to exceed 370 GBq (10 Ci), except as listed herein:

Hydrogen-3	3.7 TBq	(100Ci)
Carbon-14	3.7 TBq	(100 Ci)
Phosphorus-32	185 GBq	(5.0 Ci)
Chlorine-36	37 GBq	(1.0 Ci)
Titanium-44	37 GBq	(1.0 Ci)
Strontium-90	18.5 GBq	(500 mCi)
Zirconium-93	37 GBq	(1.0 Ci)
Niobium-94	37 GBq	(1.0 Ci)
Ruthenium-106	37 GBq	(1.0 Ci)
Cadmium-113	3.7 GBq	(100 mCi)
Iodine-125	130 GBq	(3.5 Ci)
Iodine-129	370 MBq	(10 mCi)
Iodine-131	36.999 GBq	(999 mCi)
Cerium-144	37 GBq	(1.0 Ci)
Europium-152	37 GBq	(1.0 Ci)
Europium-154	37 GBq	(1.0 Ci)
Holmium-166m	37 GBq	(1.0 Ci)
Hafnium-172	37 GBq	(1.0 Ci)
Lead-210	18.5 GBq	(500 mCi)
Bismuth-210	74 GBq	(2.0 Ci)

I. 370 GBq (10 Ci)

J. 3 TBq (81 Ci)

K. 185 GBq (5.0Ci)

L. 55.5 GBq (1.5 Ci)

M. Not to exceed 518 GBq (14 Ci) per individual neutron generator tube. Total not to exceed 1036 GBq (28 Ci)

N. 44.4 GBq (1.2 Ci)

O. No single source to exceed 407 MBq (11 mCi)

P. No single source to exceed 12.2 GBq (330 mCi)

Q. 6.8 kilograms at any one time - total possession per calendar year not to exceed 67.5 kilograms

R. possession per calendar year not to exceed 67.5 kilograms

S. 37 MBq (1.0 mCi)

LICENSE FOR RADIOACTIVE MATERIALS

License Number 02110250037

SUPPLEMENTARY SHEET

File Number / ID Number: 501167 / 3047

Amendment No. 26

6. RADIOACTIVE MATERIAL	7. CHEMICAL AND/ OR PHYSICALFORM	8. MAXIMUM QUANTITY THAT LICENSEE MAY POSSESS AT ANY ONE TIME UNDER THIS LICENSE
T. Uranium (depleted in Uranium-235)	T. Cadmium-plated metal	T. 322 kilograms
U. Polonium-210	U. Any	U. 370 MBq (10 mCi)
V. Americium-241	V. Any	V. 370 MBq (10 mCi)
W. Polonium-210	W. Sealed source	W. 37 GBq (1.0 Ci), no single source to exceed 3.7 GBq (100 mCi)
X. Americium-241	X. Sealed source	X. 74 GBq (2.0 Ci) total. One source not to exceed 22.2 GBq (600 mCi), and no other source to exceed 18.5 GBq (500 mCi)
Y. Any radioactive material, with atomic number 3 to 83, inclusive	Y. Neutron-irradiated metal	Y. 5.6 TBq (152 Ci)
Z. Americium-241	Z. Sealed source (Nuclear Material Equipment, serial No. 16AM13)	Z. 1.85 GBq (50 mCi)
AA. Uranium-235	AA. Any	AA. 370 kBq (10 µCi)
BB. Cesium-137	BB. Sealed source (Technical Operations Model No. A-424)	BB. 9.3 TBq (252 Ci)
CC. Cesium-137	CC. Sealed source (ORNL model No. ISO-1000)	CC. 26.6 TBq (720 Ci)
DD. Cesium-137	DD. Sealed source (AECL model No. C-161)	DD. 153 TBq (4.14 kCi) in two sources, no single source to exceed 76.6 TBq (2.07 kCi)
EE. Plutonium-239/Beryllium	EE. Sealed source (NUMEC - neutron-emission)	EE. 80 grams
FF. Plutonium-239/Beryllium	FF. Sealed source (neutron-emission)	FF. 800 milligrams
GG. Plutonium-239/Beryllium	GG. Sealed source (neutron-emission)	GG. 80 grams
HH. Cobalt-60	HH. Sealed sources	HH. 370 TBq (10 kCi) in 29 sources
II. Any radioactive material, with atomic number 84 or above, except source or special nuclear material	II. Any	II. 370 GBq (10 Ci) total, no single radionuclide to exceed 18.5 GBq (500 mCi)
JJ. Natural Uranium	JJ. Natural uranium in cylindrical slugs canned in aluminum tubes	JJ. 1, 460 Kilograms
KK. Any radioactive material, with atomic number 84 or above, except source or special nuclear material	KK. Sealed or plated sources	KK. 555 GBq (15 Ci) total, no single radionuclide to exceed 3.7 GBq (100 mCi)
LL. Cesium-137	LL. Sealed Source Nordion Model C440	LL. 148 TBq(4000 Ci) total , no single source to exceeds 74 TBq (2000Ci) (two C440's)

OHIO DEPARTMENT OF HEALTH	Page 4 of 7
LICENSE FOR RADIOACTIVE MATERIALS	License Number 02110250037
SUPPLEMENTARY SHEET	File Number / ID Number: 501167 / 3047
	Amendment No. 26

9. Authorized Use

- A. Any uptake, dilution, and excretion study permitted by rule 3701:1-58-32 of the Ohio Administrative Code.
- B. Any imaging and localization study permitted by rule 3701:1-58-34 of the Ohio Administrative Code.
- C. Any medical use permitted by rule 3701:1-58-37 of the Ohio Administrative Code.
- D. Any brachytherapy sources for therapeutic medical use permitted by rule 3701:1-58-43 of the Ohio Administrative Code.
- E. Any sealed source for diagnostic medical use permitted by rule 3701:1-58-53 of the Ohio Administrative Code.
- F. One sealed source for therapeutic medical use permitted by rule 3701:1-58-55 of the Ohio Administrative Code in a Varian Medical System, Inc. GammaMed Plus remote afterloader unit. One sealed source in its shipping container for replacement in the remote afterloader unit. The source activity may not exceed 370 GBq (10 Ci) at the time of installation.
- G. For medical use permitted by rule 3701:1-58-55 of the Ohio Administrative Code in a Leksell Gamma System Model No. 24001 Type C gamma stereotactic radiosurgery unit. Sources in the shipping container as necessary for replacement of the sources in the gamma stereotactic radiosurgery Unit.
- H. Medical research in humans, research, development as defined in rule 3701:1-38-01(133), instrument calibration, and student instruction.
- I. to L. For use in analytical instruments (e.g., gas chromatographs) registered per rule 3701:1-46-49 of the Ohio Administrative Code, or NRC or an Agreement Licensing State.
- M. For use in Thermo Electron Model MP 320 Neutron Generator for non-destructive analysis of carbon in soil.
- N. For calibration of the licensee's survey meters.
- O. to P. For possession and use in Troxler and Campbell Pacific Nuclear gauges which have been evaluated and approved for licensing purposes and authorized for distribution under a license issued by the Director, the NRC, or an Agreement State. To be used for moisture/density measurements.
- Q. to R. For research and development as defined in rule 3701:1-38-01 (133) of the Ohio Administrative Code and student instruction.
- S. Calibration and reference.
- T. Shielding for linear accelerators.
- U. to Z. For research and development as defined in rule 3701:1-38-01(133) of the Ohio Administrative Code.
- AA. Calibration standards for mass spectroscopy.
- BB. For use in Technical Operations Model 547 Specimen Irradiator for irradiation of organic and inorganic materials (excluding the irradiation of explosive and flammable materials).
- CC. To be used in an AECL Gammacell 1000 Irradiator for the irradiation of biological material, including human blood products.
- DD. To be used in an AECL Gammacell 40 Irradiator for the irradiation of biological material.
- EE. To be used for laboratory experiments, student instruction, and instrument calibration in conjunction with a subcritical assembly.
- FF. To be used as an instrument check source
- GG. To be used in a neutron howitzer for student instruction.
- HH. To be used in a self-contained wet storage irradiator for in-water irradiator studies.
- II. Medical diagnosis, therapy, and research in humans; research and development; animal studies; student instruction.
- JJ. To be used in a graphite-moderated assembly for experimental procedures specified in application to the Director dated June 17, 2003 for license issued under # 01129250037, and limited to classroom instruction only per rule 3701:1-38-02(J) (10) of the Ohio Administrative Code.

OHIO DEPARTMENT OF HEALTH	Page 5 of 7
LICENSE FOR RADIOACTIVE MATERIALS	License Number 02110250037
SUPPLEMENTARY SHEET	File Number / ID Number: 501167 / 3047
	Amendment No. 26

9. Authorized Use

KK. Check, calibration, and reference sources.

LL. To be used in a Best Theratronics Ltd. Gammacell 40 Irradiator for the irradiation of biological material.

CONDITIONS

10. Licensed material may only be used at the licensee's facilities located at:

- | | | |
|--|--|--|
| <p>A. The Ohio State University Campus
Columbus, Ohio

(all uses, except uses listed at locations below)</p> | <p>B. The Ohio State University Hospitals - East
1492 East Broad Street
Columbus, Ohio

(all uses, except Item 6H)</p> | <p>C. Innovation Center
2001 Polaris Parkway
Columbus, Ohio 43240

(all uses, except uses listed at locations below)</p> |
| <p>D. Radiation Medicine Department
Arthur G. James Cancer Hospital and
Richard J. Solove Research Institute
300 West 10th Avenue
Columbus, Ohio

(Items 6F, 6G and 6H)</p> | <p>E. Innovation Center
Irradiator Room
2001 Polaris Parkway
Columbus, Ohio 43240

(Item 6 CC)</p> | <p>F. Wiseman Hall
Room 109A
400 West 12th Avenue
Columbus, Ohio

(Items 6DD, 6 LL)</p> |
| <p>G. Nuclear Reactor Laboratory
1298 Kinnear Road
Columbus, Ohio 43212

(Items 6EE, 6 FF, 6 GG, 6 HH, 6 II and 6 JJ)</p> | <p>H. Stone Laboratory
Put-In Bay
Lake Erie, Ohio

(Item 6 I)</p> | <p>I. The Ohio State University
Ohio Agriculture Research and
Development Center (OARDC)
Wooster, Ohio 44691

(Item 6 I)</p> |
- J. Portable gauges may be use at temporary jobsites in the State of Ohio.

11. Radiation Safety Officer for this license is Robert E. Peterson Jr.

12. Licensed material shall be used by, or under the supervision of, individuals designated as follows:

- A. The use of licensed material in or on humans shall be by a physician, dentist, or podiatrist as defined in rule 3701:1-58-01 of the Ohio Administrative Code.
- B. Physicians, dentists, or podiatrists designated to use licensed material in or on humans shall meet the training criteria established in the criteria established in Chapter 3701:1-58 of the Ohio Administrative Code, and shall be designated by the licensee's Radiation Safety Committee. The licensee shall maintain records of individuals designated as users for five years after the individual's last use of licensed material.
- C. Licensed material for other than human use shall be used by or under the supervision of individuals designated by the Radiation Safety Committee. The licensee shall maintain records of individuals designated as users for five years after the individual's last use of licensed material.
- D. Licensed material listed in items 6/7/8 O. and P. shall only be used by, or under the supervision and in the physical presence of, individuals who have successfully completed the manufacturer's training program for gauge users, have been instructed in the licensee's routine and emergency operating procedures, and have been designated by the Radiation Safety Committee. The licensee shall maintain records of individuals designated as users and their training for five years following the last use of licensed material by the individual.
- E. Installation, relocation, removal, replacement, and disposal of sealed sources in the irradiator shall be performed by persons specifically licensed by the Director, the NRC, or an Agreement State to perform such services.
- F. All persons performing activities meeting the definition of "Nuclear Medicine Technologist" as specified in R.C. 4773.01 shall be licensed and in good standing with the state of Ohio.
13. Experimental animals or the products from experimental animals, which have been administered licensed material, shall not be used for human consumption.

OHIO DEPARTMENT OF HEALTH	Page 6 of 7
LICENSE FOR RADIOACTIVE MATERIALS	License Number 02110250037
SUPPLEMENTARY SHEET	File Number / ID Number: 501167 / 3047
	Amendment No. 26

14. Per Chapter 3701:1-44 of the Ohio Administrative Code, the licensee is authorized to possess, use, transfer, and import up to 999 kilograms of depleted uranium contained as shielding material.
15. *Sealed sources*
- A. *All sealed sources plus detector cells shall be tested for leakage and/or contamination in accordance with rule 3701:1-38-24 of the Ohio Administrative Code or at such other intervals as specified by the certificate of registration referred to in rule 3701:1-46-49 of the Ohio Administrative Code*
 - B. *Test for leakage and/or contamination shall be performed by the licensee or by other persons specifically licensed by the director, the US NRC, or Agreement state to perform such services and may perform tests for leakage and/or contamination. Sealed source or detector cells containing licensed material shall not be opened or sources removed from source holders by the licensee.*
 - C. *All sealed sources that are used or obtained shall have been evaluated and approved under the provisions of rule 3701:1-46-49 of the Ohio Administrative Code or by equivalent NRC or Agreement State regulation.*
16. The licensee is authorized to transport licensed material only in accordance with the provisions of Chapter 3701:1-50 of the Ohio Administrative Code.
17. Detector cells containing a titanium tritide foil or scandium tritide foil:
- A. shall only be used in conjunction with a properly operating temperature control mechanism which prevents the foil temperature from exceeding that specified by the manufacturer, and approved by the Director, and
 - B. shall be vented to the outside when in use.
18. Sealed sources or detector cells containing licensed material shall not be opened or sources removed from source holders by the licensee.
19. The licensee shall not perform repairs or alterations of the irradiator involving removal of shielding or access to the licensed material.
20. Radioactive waste being held for decay shall not be stored for a period greater than five (5) years. Radioactive waste awaiting disposal by transfer to a land disposal facility will not be stored for a period greater than two (2) years.
21. Portable gauge control:
- A. Each portable nuclear gauge shall have a lock or outer locked container designed to prevent unauthorized or accidental removal of the sealed source from its shielded position. The gauge or its container must be locked when in transport, storage or when not under the direct surveillance of an authorized user.
 - B. When performing tests at temporary job sites, the authorized user shall not leave the moisture/density gauge unattended. Upon completion of tests the device shall be locked in the licensee's vehicle or a secure building to prevent unauthorized use, loss, or theft.
 - C. The licensee shall conduct a physical inventory every 6 months to account for all sources received and possessed under the license. Records of inventories shall be maintained for 5 years from the date of each inventory, and shall include the quantities and kinds of radioactive material, manufacturer's name and model numbers, location of the sources and the date of the inventory.
 - D. Each portable nuclear gauge must be secured with a minimum of two independent physical controls that form tangible barriers to secure portable gauges from unauthorized removal, whenever portable gauges are not under the control and constant surveillance of the licensee, in accordance with rule 3701:1-40-16(H) of the Ohio Administrative Code.
22. In addition to the possession limits in Item 8, the licensee shall further restrict the possession of licensed material to quantities below the limits specified in 3701:1-40-14(G) of the Ohio Administrative Code, which require consideration of the need for an emergency plan for responding to a release of licensed material.
23. The licensee shall comply with the requirements described in the Ohio Department of Health letter dated November 16, 2005 and attached document entitled "Increased Controls for Licensees that Possess Sources Containing Radioactive Material Quantities of Concern." The licensee shall complete implementation of said requirements within six (6) months from the issuance of the license amendment or the first day that radionuclides in quantities of concern are possessed at or above the limits specified in Table 1 of the

OHIO DEPARTMENT OF HEALTH	Page 7 of 7
LICENSE FOR RADIOACTIVE MATERIALS	License Number 02110250037
SUPPLEMENTARY SHEET	File Number / ID Number: 501167 / 3047
	Amendment No. 26

attachment, whichever is later. Within 25 days after the implementation of the requirements of this condition, the licensee shall notify the Ohio Department of Health in writing that it has completed the requirements of this condition.

24. In accordance to rule 3701:1-58-30 of the Ohio Administrative Code, any patient administered gamma emitting radiopharmaceuticals or permanent brachytherapy sources shall be provided a patient release card to include:
- (1) The patient's name.
 - (2) The radionuclide administered and its activity.
 - (3) The facility name which administered the radionuclide.
 - (4) The date of the administration of the radionuclide.
 - (5) The expiration date of the card.

The card is not applicable to those patients who are institutionalized (Hospitals, Nursing Homes, Correctional Institutions, etc.) or whose radiation levels do not exceed 0.1 mR/hr at one meter.

25. The licensee shall comply with the requirements described in the Ohio Department of Health Order dated April 28, 2008. The licensee shall complete implementation of said requirements by October 28, 2008. The licensee shall notify the Ohio Department of Health when they have achieved full compliance with the requirements described in the Order. The notification shall be made within twenty-five (25) days after full compliance has been achieved. This notification shall include a certification that the Trustworthiness and Reliability (T&R) Official (and any subsequent T&R Official) is themselves deemed trustworthy and reliable by the Licensee as required in paragraph B.2. of the Order. The licensee shall notify the Ohio Department of Health within 24 hours if the results from a criminal history records check indicate that an individual is identified on the FBI's Terrorist Screening Data Base.
26. 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 Ohio Department of Health's statutes, rules, and orders shall govern unless statements, representations, and procedures in the licensee's application and correspondence are more restrictive than the regulations.
- A. Renewal application dated December 11, 2006 and letter dated February 1, 2007
 - B. Amendment #22 to license number 02110250037; renewed in its entirety.
 - C. Director's Order dated April 28, 2008 (Amendment 23).
 - D. Letter dated June 3, 2008 (Amendment 24).
 - E. Facsimile dated April 8, 2009 (Amendment #25)
 - F. Facsimile dated May 19, 2009 (Amendment #26)

For the Ohio Department of Health

DATE:

5/19/09

BY:



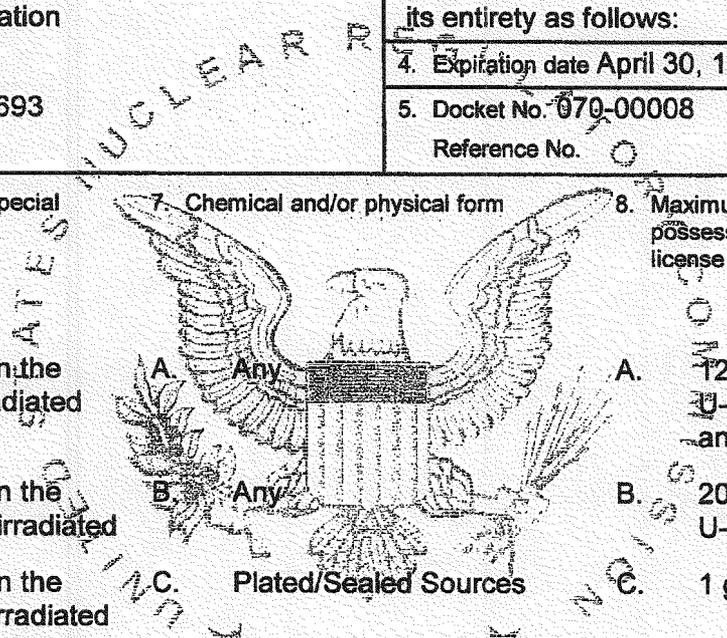
Robert E. Owen, Chief
Bureau of Radiation Protection
On Behalf of the Director of Health

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 style="text-align: center;">Licensee</p> <p>1. Battelle Memorial Institute Battelle Columbus Operation</p> <p>2. 505 King Avenue Columbus, OH 43201-2693</p>	<p>In accordance with the letter dated October 25, 1999</p> <p>3. License number SNM-7 is amended in its entirety as follows:</p> <p>4. Expiration date April 30, 1988 (on timely renewal)</p> <p>5. Docket No. 070-00008 Reference No. 0</p>
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<p>6. Byproduct, source, and/or special nuclear material</p> <p>West Jefferson Site</p> <p>A. Uranium enriched in the U-235 isotope - Irradiated</p> <p>B. Uranium enriched in the U-235 isotope - Unirradiated</p> <p>C. Uranium enriched in the U-235 isotope - Unirradiated</p> <p>D. Plutonium (any principal isotope Pu-236-244)</p> <p>E. Plutonium (Pu-238 principal isotope)</p> <p>F. Plutonium (Pu-239 principal isotope)</p> <p>G. Neptunium-237</p> <p>H. Plutonium (Pu-238 principle isotope)</p> <p>I. Plutonium (PU-238 principal isotope)</p> <p>J. Plutonium (Pu-239 principal isotope)</p>	<p>7. Chemical and/or physical form</p> <p>A. Any</p> <p>B. Any</p> <p>C. Plated/Sealed Sources</p> <p>D. Any</p> <p>E. Solid Oxide, with multiple constraints</p> <p>F. Solid Metal or Oxide, with multiple constraints</p> <p>G. Sealed Source</p> <p>H. PuBe Source</p> <p>I. Solid Scrap</p> <p>J. Solid Scrap</p>	<p>8. Maximum amount that licensee may possess at any one time under this license</p> <p>A. 125 grams of contained U-235 plus the associated and unseparated plutonium</p> <p>B. 20 grams of contained U-235</p> <p>C. 1 gram of U-235 total</p> <p>D. 0.1 gram total</p> <p>E. 10.3 grams</p> <p>F. 17.0 grams</p> <p>G. 1.0 microcurie</p> <p>H. 0.053 grams</p> <p>I. 3.4 grams</p> <p>J. 3.0 grams</p>
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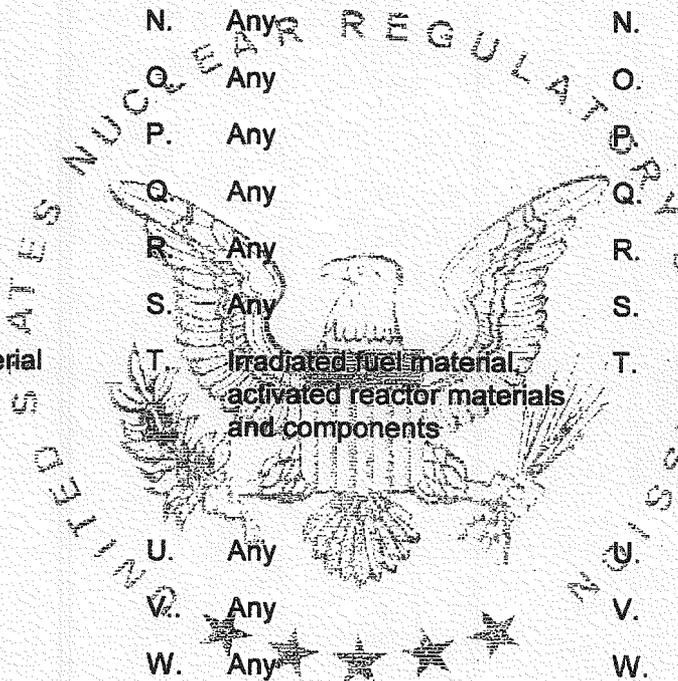
**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License Number
SNM-7

Docket or Reference Number
070-00008

Amendment No. 19

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
K. Uranium 232	K. Any	K. 0.99 grams
L. Uranium 233	L. Any	L. 0.99 grams
M. Uranium 234	M. Any	M. 0.99 gram
N. Uranium 235	N. Any	N. 0.99 grams
O. Plutonium 236	O. Any	O. 0.04 micrograms
P. Plutonium 238	P. Any	P. 0.6 micrograms
Q. Plutonium 239	Q. Any	Q. 82.0 micrograms
R. Plutonium 240	R. Any	R. 22.0 micrograms
S. Plutonium 242	S. Any	S. 6.4 micrograms
T. Any byproduct material	T. Irradiated fuel material, activated reactor materials and components	T. 50,000 curies total, not more than 5,000 curies of any one radioisotope (excluding items 6.U. through 6.II. below)
U. Hydrogen-3	U. Any	U. 500 curies
V. Polonium-210	V. Any	V. 500 curies
W. Californium-252	W. Any	W. 500 curies
X. Sulfur-35	X. Gas	X. 1,000 curies
Y. Chlorine-36	Y. Gas	Y. 1,000 curies
Z. Iodine-131	Z. Any	Z. 1,000 curies
AA. Iodine-129	AA. Any	AA. 60 curies
BB. Cobalt-60	BB. Any	BB. 5,000 curies
CC. Cesium-137	CC. Any	CC. 5,000 curies
DD. Strontium-90	DD. Any	DD. 5,000 curies
EE. Carbon-14	EE. Any	EE. 2 curies
FF. Krypton-85	FF. Gas	FF. 500 millicuries



**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License Number
SNM-7

Docket or Reference Number
070-00008

Amendment No. 19

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|--|--|--|
| <p>6. Byproduct, source, and/or special nuclear material</p> <p>GG. Americium-241</p> <p>HH. Nickel-63</p> <p>II. Any byproduct material</p> | <p>7. Chemical and/or physical form</p> <p>GG. Any</p> <p>HH. Any</p> <p>II. Any</p> | <p>8. Maximum amount that licensee may possess at any one time under this license</p> <p>GG. 10 millicuries</p> <p>HH. 600 millicuries</p> <p>II. 500 millicuries total not to exceed 100 millicuries per radionuclide</p> |
|--|--|--|

King Avenue Site

- | | | |
|--|--|---|
| <p>JJ. Uranium (enriched in U-235 isotope, irradiated)</p> <p>KK. Any byproduct material</p> | <p>JJ. residual contamination</p> <p>KK. Any</p> | <p>10 micrograms of contained U-235 plus the associated and unseparated plutonium and mixed fission products</p> <p>KK. 500 curies total, not more than 35 curies of any one radioisotope</p> |
|--|--|---|

West Jefferson and King Avenue Sites

- | | | |
|--------------------------------|----------------|-------------------------|
| <p>LL. Any Source Material</p> | <p>LL. Any</p> | <p>LL. 50 kilograms</p> |
|--------------------------------|----------------|-------------------------|

Temporary Job sites

- | | | |
|---|---|---|
| <p>MM. Nickel-63</p> <p>NN. Americium-241</p> | <p>MM. Sealed sources registered pursuant to 10 CFR 32.210 and incorporated into gas chromatograph and/or aerosol/airborne contaminant gas and vapor detector as specified in Item 10.</p> <p>NN. Sealed sources registered pursuant to 10 CFR 32.210 and incorporated into gas chromatograph and/or aerosol/airborne contaminant gas and vapor detector as specified in Item 10.</p> | <p>MM. 600 millicuries total. No single source to exceed 40 millicuries.</p> <p>NN. 500 millicuries total. No single source to exceed 50 millicuries.</p> |
|---|---|---|



**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License Number

SNM-7

Docket or Reference Number

070-00008

Amendment No. 19

- | | | |
|---|---|--|
| 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 |
| OO. Hydrogen-3 | OO. Titanium tritide sources registered pursuant to 10 CFR 32.210 and incorporated into gas chromatograph and/or aerosol/airborne contaminant gas and vapor detector as specified in Item 10. | OO. 3 curies total. No single source to exceed 200 millicuries. |
| PP. Americium-241 | PP. Sealed sources registered pursuant to 10 CFR 32.210 and incorporated into gauging devices as specified in Item 10. | PP. 400 millicuries total. No single source to exceed 100 millicuries. |
| QQ. Cesium-137 | QQ. Sealed sources registered pursuant to 10 CFR 32.210 and incorporated into gauging devices as specified in Item 10. | QQ. 200 millicuries total. No single source to exceed 50 millicuries. |
| RR. Americium-241 | RR. Sealed source (CPN Model No. 131) | RR. One source not to exceed 50 millicuries |

9. Authorized places of Use:

- A. License materials may be used and stored in buildings and facilities approved by the licensee's Radiation Safety Committee, at sites indicated above under Items 6, 7, and 8. The licensee will submit final status surveys for buildings or areas which are to be released for unrestricted use via a license amendment.
- B. Licensed materials listed in Subitems MM., NN., OO., PP., Q.Q., and RR. may be used at temporary job sites of the licensee anywhere in the United States where the U.S. Nuclear Regulatory Commission maintains jurisdiction for regulating the use of licensed material. The possession of these devices are in addition to devices authorized under Subitem KK.

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License Number

SNM-7

Docket or Reference Number

070-00008

Amendment No. 19

CONDITIONS

10. Authorized use:

- A. For use in accordance with statements, representations, and conditions contained in the following portions of the licensee's application for renewal (BCL Document 1081) submitted by letter dated October 23, 1981, except as may be modified by the conditions of this license:
1. Pages vi through xi, Introduction;
 2. Part I, License Conditions;
 3. Appendix A, Radiological Safety Committee Charter; and
 4. Letters dated June 29, 1994, August 19, 1994, July 6, 1995 (excluding Item 1), and August 3, 1995 (excluding Item 1)..
- B. Items E, F, I and J are authorized for storage only.
- C. The principal use for items A. and B. under Conditions 6, 7, and 8, are as residual contamination at the West Jefferson North Site.
- D. Item U. may be used for tritium targets as indicated in letter dated July 21, 1999, and as residual material arising from previous operations.
- E. The principal uses for item LL. under Conditions 6, 7, and 8 are use as residual contamination at BMI's King Avenue and West Jefferson facilities.
- F. Item H. under Conditions 6, 7, and 8 have been transferred to the license from DOE inventory to be used for calibration.
- G. Items K. through S.. are for research and development, and support of Radiological Laboratory Operation as described in letters dated November 17, 1994, March 21, 1995, and October 20, 1997.
- H. Item FF. is for storage only pending disposal.
- I. Items GG., HH., and II.. are for research and development activities as described in letters dated June 29, 1994 August 19, 1994, and March 21, 1995.
- J. Item RR. is for use in a Campbell Pacific Nuclear Model 503 portable moisture/density gauge.
- K. Item EE. is to be used for research and development as described in 10 CFR Part 30, Section 30.4.
- L. Items MM., through OO. of Items 6, 7, and 8 are for use in compatible gas chromatograph devices and or aerosol/airborne contaminant gas and vapor devices which have been registered pursuant to 10 CFR 32.210 and distributed in accordance with an NRC or Agreement State specific license to persons specifically licensed by the NRC to receive, possess and use the devices.

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License Number

SNM-7

Docket or Reference Number

070-00008

Amendment No. 19

17. At such time that facilities covered by this license are decontaminated for proposed unrestricted release, the licensee shall submit a report that identifies the facilities where radioactive materials were used and stored, or disposed on the site. The report shall briefly describe operations conducted and radioactive materials used in the facilities and shall assess the results of the decontamination activities. The report shall provide the basis for unrestricted release of the facilities and the site, including a description of sampling and survey methods and instrumentation used, and shall include final contamination survey data for the facilities and grounds. The licensee may segment the report to obtain release of certain areas of facilities or individual structures if it is demonstrated that ongoing activities in other areas will not lead to recontamination of the area or structure proposed for release.
18. Moisture density gauges containing licensed materials shall only be used by, or under the supervision and in the physical presence of, individuals who have received the training described in letters dated June 29, 1994 and August 19, 1994, or by the device manufacturer or persons licensed to provide such training, and have been approved in writing by the Radiation Safety Officer. Leak test may be performed by individuals approved by the Radiation Safety Officer.
19. When performing tests at temporary job sites, the authorized user shall not leave the moisture/density gauge unattended. Upon completion of tests the device shall be locked in the licensee's vehicle or a secure building to prevent unauthorized use, loss, or theft.
20. The licensee is authorized to transport the portable moisture/density gauge only in accordance with the provisions of 10 CFR Part 71, "Packaging and Transportation of Radioactive Material."
21. Each portable nuclear gauge shall have a lock or outer locked container designed to prevent unauthorized or accidental removal of the sealed source from its shielded position. The gauge or its container must be locked when in transport, storage, or when not under the direct surveillance of an authorized user.
22. Sealed byproduct material sources shall be subject to the leak testing and actions specified in the attached procedure titled "License Condition for Leak Testing Sealed Byproduct Material Sources," dated April 1993. Sealed plutonium sources shall be subject to the leak testing and actions specified in the attached procedure titled "License Condition for Leak Testing Sealed Plutonium Sources," dated April 1993.
23.
 - 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 specified by the certificate of registration referred to in 10 CFR 32.210.
 - 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 leak test has been made within 6 months prior to the transfer, a sealed source received from another person shall not be put into use until tested.

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License Number

SNM-7

Docket or Reference Number

070-00008

Amendment No. 19

- 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 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 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 or detector cell shall be stored for a period of more than 10 years without being tested for leakage and/or contamination.
- F. The leak test shall be capable of detecting the presence of 0.005 microcuries of radioactive material on the test sample. If the test reveals the presence of 0.005 microcuries or more of removable contamination, a report shall be filed with the U.S. Nuclear Regulatory Commission in accordance with 10 CFR 30.50(b)(2), and the source shall be removed immediately 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 III, 801 Warrenville Road, Lisle, IL 60532; ATTN.: Director, Division of Nuclear Materials Safety. The report shall specify the source involved, the test results, and corrective action taken.
- G. Tests for leakage and/or contamination shall be performed by the licensee or by other persons specifically licensed by the Commission or an Agreement State to perform such services.

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License Number

SNM-7

Docket or Reference Number

070-00008

Amendment No. 19

24. 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. Letters dated October 11, 1995 (with attachments), September 29, 1997, two letters dated October 20, 1997, December 24, 1997, December 30, 1997, September 15, 1998, January 11, 1999, January 26, 1999, February 5, 1999, February 26, 1999, April 12, 1999, May 4, 1999, May 14, 1999, May 21, 1999, August 25, 1999, and October 25, 1999.



FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Date

12/01/99

By

George M. McCannGeorge M. McCann
Materials Licensing Branch
Region III

This is to acknowledge the receipt of your letter application dated

9/10/09, and to inform you that the initial processing which includes an administrative review has been performed.

Amendment (08-30577-01) 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

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 144156.
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 (RI)
(6-96)

Sincerely,
Licensing Assistance Team Leader