

NRC Form 313 I (12-81) 10 CFR 30		U.S. NUCLEAR REGULATORY COMMISSION		1. APPLICATION FOR: <i>(Check and/or complete as appropriate)</i>	
APPLICATION FOR BYPRODUCT MATERIAL LICENSE INDUSTRIAL				<div style="border: 1px solid black; padding: 2px;">a. NEW LICENSE</div>	
<i>See attached instructions for details.</i> 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.				<div style="border: 1px solid black; padding: 2px;">b. AMENDMENT TO: LICENSE NUMBER</div>	
				<div style="border: 1px solid black; padding: 2px;">c. RENEWAL OF: LICENSE NUMBER</div>	
				XX 34-18196-01	
2. APPLICANT'S NAME <i>(Institution, firm, person, etc.)</i> Northeastern Ohio Universities College of Medicine TELEPHONE NUMBER: AREA CODE - NUMBER EXTENSION (216) 325-2511			3. NAME AND TITLE OF PERSON TO BE CONTACTED REGARDING THIS APPLICATION Michael D. Powell, RSO TELEPHONE NUMBER: AREA CODE - NUMBER EXTENSION (216) 325-2511 Ext. 439		
4. APPLICANT'S MAILING ADDRESS <i>(Include Zip Code)</i> <i>(Address to which NRC correspondence, notices, bulletins, etc., should be sent.)</i> 4209 State Route 44 Rootstown, Ohio 44272			5. STREET ADDRESS WHERE LICENSED MATERIAL WILL BE USED <i>(Include Zip Code)</i> NEOUCOM 4209 State Route 44 Rootstown, Ohio 44272		
(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 <i>(See Items 16 and 17 for required training and experience of each individual named below)</i>					
FULL NAME			TITLE		
a. See attached item					
b.					
c.					
7. RADIATION PROTECTION OFFICER Michael D. Powell			<i>Attach a resume of person's training and experience as outlined in Items 16 and 17 and describe his responsibilities under Item 15</i>		
8. LICENSED MATERIAL					
LINE NO.	ELEMENT AND MASS NUMBER A	CHEMICAL AND/OR PHYSICAL FORM B	NAME OF MANUFACTURER AND MODEL NUMBER <i>(If Sealed Source)</i> C	MAXIMUM NUMBER OF MILLICURIES AND/OR SEALED SOURCES AND MAXIMUM ACTI- VITY PER SOURCE WHICH WILL BE POSSESSED AT ANY ONE TIME D	
(1)	See attached item				
(2)					
(3)					
(4)					
DESCRIBE USE OF LICENSED MATERIAL E					
(1)	See attached item				
(2)					
(3)	8506070565 850522 REG LIC30 3418196-01 PDR				
(4)					

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)	None		
(2)			
(3)			
(4)			

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)	See attached item					
(2)						
(3)						
(4)						

11. CALIBRATION OF INSTRUMENTS LISTED IN ITEM 10

<input type="checkbox"/> a. CALIBRATED BY SERVICE COMPANY NAME, ADDRESS, AND FREQUENCY Victoreen, Inc. 10101 Woodland Avenue Cleveland, Ohio 44104 <div style="text-align: right; margin-top: 10px;">Annual Calibration</div>	<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 checked="" type="checkbox"/> (1) FILM BADGE <input type="checkbox"/> (2) THERMOLUMINESCENCE DOSIMETER (TLD) <input type="checkbox"/> (3) OTHER (Specify): _____ _____ _____	R.S. Landauer, Jr. & Co. Glenwood Science Park Glenwood, Illinois 60425	<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).)

- ☒ a. LABORATORY FACILITIES, PLANT FACILITIES, FUME HOODS (Include filtration, if any), ETC.
☒ b. STORAGE FACILITIES, CONTAINERS, SPECIAL SHIELDING (fixed and/or temporary), ETC.
☐ c. REMOTE HANDLING TOOLS OR EQUIPMENT, ETC.
☐ d. RESPIRATORY PROTECTIVE EQUIPMENT, ETC.

14. WASTE DISPOSAL

- a. NAME OF COMMERCIAL WASTE DISPOSAL SERVICE EMPLOYED
 ADCO Services, Inc. ; P.O. Box 35 ; Tinley Park, Illinois 60477
- 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.

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.

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)

Exempt

b. CERTIFYING OFFICIAL *(Signature)*

c. NAME *(Type or print)*

Glenn A. Saltzman

(1) LICENSE FEE CATEGORY: Exempt

d. TITLE

Director, Division of Basic Medical Sciences

(2) LICENSE FEE ENCLOSED: \$ Exempt

e. DATE

November 16, 1984

Item #6 : Individuals who will use or directly supervise the use of licensed material.

The following individuals (#1-15) are listed on our current license and should appear on the renewed license. Please refer to that license for Items 16 and 17 (Formal Training in Radiation Safety and Experience).

	Approved Isotopes
1. John Y. Chaing, Ph.D.	"
2. Richard Depew, Ph.D.	"
3. Judith Finkelstein, Ph.D.	"
4. James M. Gilliam, Ph.D.	"
5. Frank Hutterer, Ph.D.	"
6. Michael Kehoe, Ph.D.	"
7. Peter Koo, Ph.D.	see
8. George Malindzak, Ph.D.	current license
9. Jann Nielsen, Ph.D.	"
10. Norman Paradise, Ph.D.	"
11. Kenneth Rosenthal, Ph.D.	"
12. Rochelle Seide, Ph.D.	"
13. Alan Steggles, Ph.D.	"
14. Sherry Stuesse, Ph.D.	"
15. Edward Truitt, Ph.D.	"

The following individuals (#16 and 17) are new additions to the list of users. Their formal training and experience are given in Items 16 and 17. Mr. Powell's training and experience are given in item 7.

	Approved Isotopes
16. Theodore Voneida, Ph.D.	^3H & ^{14}C
17. Michael Maron, Ph.D.	^3H & ^{14}C
18. Michael D. Powell	ALL

Item # 7 : Radiation Safety Officer

The duties of the Radiation Safety Officer are explained in the NEOUCOM Radiation Safety Manual, Revised November 16, 1984 and appended to this renewal application.

Specifically, the duties of the RSO are given in Section I, Part C, item 2 on page 2 of the manual.

Mr. Powell's qualifications are included in the attached NRC amendment to our current license.

Item #8 : Licensed Material (unsealed sources)

All items listed below are those shown in the current license except for the following changes:

- a. For reasons of inventory control we request a change in possession limit of 125-I from 200 mCi to 300 mCi. Use of this isotope will continue as previously stipulated; we intend no altered procedures in the handling of 125-I.
- b. We request the addition of 65-Zn to the list of licensed isotopes. Dr. Peter Koo intends to use this isotope in in vitro metabolic studies. In particular, he intends to examine binding properties of zinc with selected proteins, and to perform autoradiography with this isotope. We request a possession limit of 10 mCi.

Mass No.	Element	Chemical/Physical Form	Possession Limit (mCi)
3	Hydrogen	any	400
14	Carbon	any	200
28	Magnesium	any	10
32	Phosphorus	any	70
35	Sulfur	any	30
42	Potassium	any	10
45	Calcium	any	30
46	Scandium	any	10
51	Chromium	any	100
65	Zinc	(see above)	10
81m/81	Krypton/Rubidium	any	50
85	Strontium	any	10
86	Rubidium	any	50
95	Niobium	any	10
99m	Technetium	any	50
125	Iodine	any	300 (see above)
131	Iodine	any	100
141	Cerium	any	10
169	Ytterbium	any	10

Item #10 : Instrumentation

Type of Instrument	Manufacturer	Model #	Number Available	Radiation Detected	Sensitivity Range
Survey Meter with GM Probe	Victoreen Victoreen	493 491-40	2	beta above 200 kev gamma above 12 kev	0 - 50 mR/hr
Survey Meter with Pancake GM Probe	Victoreen Victoreen	493 489-110	1	alpha above 3.5 Mev beta above 35 kev gamma above 6 kev	0 - 7.5 mR/hr
Frisker Meter with GM Probe	Victoreen Victoreen	495 491-40	1	beta above 200 kev gamma above 12 kev	0 - 500,000 CPM
Survey Meter with Scint. Probe	Victoreen Victoreen	490 425-110	1	gamma 10 - 40 kev	.2 - 20 mR/hr or 0 - 800,000 CPM
Ion Chamber	Victoreen	470A	1	alpha above 8 Mev beta above 120 kev gamma above 10 kev	0 - 3 R/hr
Pocket Dosimeter	Victoreen	541R	2	gamma 30 kev - 2 Mev	0 - 200 mR/hr
Multi Channel Analyser	Packard	9012	1	gamma	0 - 6,000,000 CPM
Liquid Scint. Spectrometer	Beckman	LS 9000	2	beta, gamma	0 - 6,000,000 CPM
Liquid Scint. Spectrometer	Beckman	LS 100C	1	beta, gamma	0 - 6,000,000 CPM

Item #15 : NEOUCOM's radiation protection program is described in the Radiation Safety Manual revised in November 1984 and appended to this application. Included in this manual are the following topics:

a) Duties of the Radiation Safety Officer	Section I, C-2
b) Personnel Training	II
c) Monitoring of personnel including bioassay	III, A & B
d) Laboratory Monitoring Program	III, C
e) Routine procedures for ordering, receiving, using, storing, and disposing of radioactive materials.	IV
f) Emergency Procedures	V

Item's #16 and #17 : The formal training in radiation safety and the experience in safe handling of radioisotopes for individuals listed #1-15 in Item #6 of this renewal application have been provided previously. Please refer to our current license for their credentials.

Dr. Michael Maron and Dr. Theodore Voneida are new additions to this license. Their credentials are summarized on the following pages.

Dr. Maron wishes to be licensed to use

^3H & ^{14}C

Dr. Voneida wishes to be licensed to use

^3H & ^{14}C

Name of investigator MICHAEL MARON, Ph.D

TRAINING AND EXPERIENCE OF INDIVIDUAL NAMED

TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB	FOR COUN
a. Principles and practices of radiation protection.	NEOUCOM U.C. Santa Barbara	Semester Course 1 YR	X	X
b. Radioactivity measurement and monitoring techniques and instrumentation.	NEOUCOM U.C. Santa Barbara	Semester 1 YR	X	
c. Mathematics and calculations basic to the use and measurement of radioactivity.	NEOUCOM UC Santa Barbara	Semester 1 YR	X	X
d. Biological effects of radiation.	NEOUCOM UC Santa Barbara	Semester 1 YR	X	X

EXPERIENCE WITH RADIOACTIVE MATERIALS

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED
³ H		U.C. Santa Barbara
DURATION OF EXPERIENCE		TYPE OF USE (e.g. chemical synthesis, etc.)
U.C. Santa Barbara - 1 YEAR		RIA for cortisol, liquid scintillation

Name of investigator Theodore Voneida, Ph.D.

TRAINING AND EXPERIENCE OF INDIVIDUAL NAMED

TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB	FOR COU
a. Principles and practices of radiation protection.	Northeastern Ohio Universities College of Medicine (NEOUCOM)	1 semester	x	x
b. Radioactivity measurement and monitoring techniques and instrumentation.	Case Western Reserve University (CWRU) NEOUCOM	8 years	x	
c. Mathematics and calculations basic to the use and measurement of radioactivity.	NEOUCOM	1 semester		x
d. Biological effects of radiation.	NEOUCOM	3 years	x	x

EXPERIENCE WITH RADIOACTIVE MATERIALS

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED
3 - H	10 mCi	CWRU and NEOUCOM

DURATION OF EXPERIENCE	TYPE OF USE (e.g. chemical synthesis, etc.)
8 years	Autoradiography of neurobiological tracing experiments.

Item #18 : The Northeastern Ohio Universities College of Medicine is a non-profit educational institution. Byproduct materials are used exclusively for teaching and research. Uses of radioactive materials are for basic scientific research, not for medical purposes. NEOUCOM is an educational institution supported by the State of Ohio.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
750 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

AUG 22 1984

Northeastern Ohio Universities
College of Medicine
ATTN: Glenn, A. Saltzman, Ph.D.
Director, Division of Basic
Medical Sciences
Rootstown, OH 44272

Gentlemen:

Enclosed is Amendment No. 12 to your NRC License No. 34-18196-01 in accordance with your request.

Please review the enclosed document carefully and be sure that you understand all conditions. You must conduct your program involving radioactive 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:

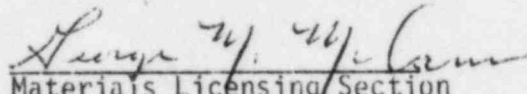
1. Operate in accordance with NRC regulations 10 CFR Part 19, "Notices, Instruction and Reports to Workers; Inspection," 10 CFR Part 20, "Standards for Protection Against Radiation," and other applicable regulations.
2. Possess radioactive material only in the quantity and form indicated in your license.
3. Use radioactive material only for the purpose(s) indicated in your license.
4. Notify NRC in writing of any change in mailing address.
5. Request and obtain appropriate amendment if you plan to change ownership of your organization, change locations of radioactive material, or make any other changes in your facility or program which are contrary to your license conditions or representations made in your license application and any supplemental correspondence with NRC. Any amendment request should be accompanied by the appropriate fee specified in 10 CFR Part 170.
6. Submit a complete renewal application with proper fee or termination request at least 30 days before the expiration date on your license. You will receive a reminder notice approximately 90 days before the expiration date. Possession of radioactive material after your license expires is a violation of NRC regulations.
7. Request termination of your license if you plan to permanently discontinue activities involving radioactive material prior to your expiration date.

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You will be periodically inspected by NRC. Failure to conduct your program in accordance with NRC regulations, license conditions and representations in your license application will result in enforcement action against you in accordance with the General Policy and Procedures for NRC Enforcement Actions, 10 CFR Part 2, Appendix C.

If you have any questions or require clarification of any of the above stated information, contact us at (312) 790-5625.

Sincerely,


Materials Licensing Section

Enclosures:

1. 10 CFR Part 2, Appendix C
2. 10 CFR Parts 19 and 20
3. Amendment No. 12

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License number

34-18196-01

Docket or Reference number

Amendment No. 12

Northeastern Ohio Universities
College of Medicine
Routstown, OH 44272

In accordance with letter dated June 18, 1984, License Number 34-18196-01 is amended as follows:

Condition 16. is amended to read:

16. 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 June 23, 1978; letter (with enclosures) dated November 20, 1978; and letters dated June 20, 1979, October 4, 1979, July 16, 1980, February 18, 1982, March 10, 1982 and June 18, 1984 (with enclosures). 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.

Condition 18. is added:

18. The Radiation Protection Officer for the activities authorized by this license is Michael D. Powell, B.A.

For the U.S. Nuclear Regulatory Commission

AUG 22 1984

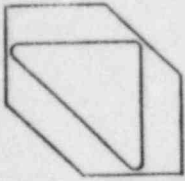
Date

By

George M. McLean
Materials Licensing Section, Region III

84691/0005

COLLEGE OF MEDICINE



B. J. Holt
Region III Licensing Section
Material Licensing Branch
Division of Fuel Cycle and Material Safety

6/18/84

RE: Amendment to NRC License No. 34-18196-01 requesting change of RSO.

Dear Ms. Holt,

I would like to request an amendment to our materials license making Mr. Michael D. Powell the Radiation Safety Officer at the Northeastern Ohio Universities College of Medicine. Currently, Robert T. Heath, Ph.D. is our RSO and Mr. Powell is the Assistant RSO.

Dr. Heath is the RSO at Kent State University and has been working as NEOUCOM'S RSO on a consultant basis since April 30, 1982. Mr. Powell is a full time employee and spends about 20-30 hours per week on Radiation Safety. Dr. Heath has agreed to continue his consultant services with the College of Medicine and conduct unannounced inspections of the Radiation Safety Office on a semiannual basis over the next year. He will file a report with the Director of Basic Medical Sciences at NEOUCOM detailing the results of his inspections. Dr. Heath will also be available on an as needed basis to address unforeseen needs and events.

Mr. Powell has worked at the NEOUCOM since 1977. His current titles are Histology Laboratory Supervisor, Institutional Safety Officer, and Assistant Radiation Safety Officer. Mr. Powell is also an Instructor for the Microscopic Anatomy program teaching 3rd year medical students one day per week during the fall semester. He holds a B.A. in Biology from the State University College at Buffalo, is a certified HT by the American Society of Clinical Pathologists, and is currently completing a M.S. in Cell Biology from Kent State University. Attached you will find a detailed outline of his qualifications for this position. He has also responded to the 25 characteristics outlined in the NRC Draft Regulatory Guide and Value/Impact Statement on "Qualifications For The RSO In A Large-Scale Non-Fuel-Cycle Radionuclide Program". Although the NEOUCOM would best qualify as a small to medium sized program with specific and non-flexible characteristics, we feel that he can meet your qualifications for the large scale flexible program.

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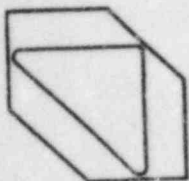
Northeastern Ohio Universities College of Medicine

As per Mr. Powell's telephone conversation with your office on 6/8/84, I am requesting this amendment as part of our current materials license, and not part of our pending renewal. If Mr. Powell meets your qualifications and this amendment request is approved, please advise on how best to correct our renewal application filed 11/83 (Control No. 16404) to reflect this change of RSO. Please feel free to contact Dr. Heath, Mr. Powell, or me if you need any additional information. We can be reached at (216)-325-2511, Extensions 280, 290, and 367 respectively.

Sincerely,

Glenn A. Saltzman, Ph.D.
Director, Division of Basic
Medical Sciences

Northeastern Ohio
Universities
COLLEGE OF MEDICINE



Rootstown, Ohio 44272

Phone: 216-325-2511

6/18/84

B. J. Holt
Region III Licensing Section
Material Licensing Branch
Division of Fuel Cycle and Material Safety

Dear Ms. Holt,

I have prepared the following in response to the 25 characteristics outlined in appendix A of the NRC draft regulatory guide on "Qualifications for the RSO in a Large-Scale Non-Fuel-Cycle Radionuclide Program. Although the Northeastern Ohio Universities College of Medicine has a specific license and relatively non-flexible program, I feel that I can meet your qualifications for a broad license flexible program outlined in appendix A.

Since 1977, I have held several technical and administrative positions at the NEOUCOM. I am currently performing four main duties: Histology Laboratory Supervisor, Institutional Safety Officer, Assistant Radiation Safety Officer, and Instructor of Microscopic Anatomy. I spend approximately 20-40% of my time supervising the histology laboratory and teaching Microscopic Anatomy. The remainder of my time is spent on safety related issues, occupational as well as radiation safety. Since becoming involved with the Radiation Safety Program in spring of 1982, I have spent a great deal of my time studying for this position.

APPENDIX A

1) Ability to communicate clearly, both verbally and in writing.

The various positions I hold at the NEOUCOM all demand strong communication skills. I continually interact with administrative officers, faculty members, staff employees, graduate students, and medical students. I am a member of several NEOUCOM committees and have held office as both a trustee and secretary of the Electron Microscopy Society of Northeastern Ohio.

2) Knowledge of mathematics, physics, chemistry, and biology ...

I currently hold a B.A. in Biology from the State University College at Buffalo, New York. My coursework included Calculus, Statistics, Inorganic and Organic Chemistry, Physics, Astronomy, Oceanography, Anthropology, Ecology, Philosophy, Sociology, and English, as well as numerous Biology Courses. I am nearing completion on an M.S. in Cell Biology from Kent State University. My coursework to date has included Electron Microscopy, Radiation Safety, Molecular

Dr. J. Holt

Genetics, Cell Biology, Microscopic Anatomy, Bioenergetics, and Biological Instrumentation.

3) Knowledge of current standards, guides, and reports ...

NEOUCOM's library and Radiation Safety Office contain information from numerous sources on Radiation and General Occupational Safety. I have spent a great deal of time researching this material and studying current and recommended safety practices. I have also visited and communicated with several regional universities to examine their radiation safety programs, and evaluate our own accordingly.

4) Knowledge of applicable NRC regulations, regulatory guides, ...

I believe that this is one of my strongest qualifications, and an area where I have contributed the most to NEOUCOM's present radiation safety program. The Radiation Safety Office maintains copies of all applicable NRC and DOT regulations, guides, and reports on file at all times. I have attended several workshops on regulatory compliance and radioactive waste disposal during the past two years, and anticipate continued attendance at similar events in the future.

5) Knowledge and ability sufficient to operate instruments ...

I am knowledgeable in the use and interpretation of all of the equipment listed in item #1. I was also instrumental in evaluating the equipment present in 1982, and purchasing new equipment to cover areas insufficiently monitored.

6) Knowledge and ability sufficient to perform calibrations ...

Although I routinely check the calibration of all radiation safety instruments with ¹³⁷-Cs check sources, all equipment is recalibrated by the original vendor on an annual basis.

7) Knowledge and ability sufficient to select instruments ...

Most of the equipment listed in item #1 was purchased by the college prior to 1982, when Dr. Heath and I took over the program. An evaluation at that time revealed the need for meters specifically capable of efficiently detecting ¹²⁵-I. I compared various types of equipment and finally purchased the Victoreen model #490 Thyac III survey meter with #425-110 scintillation probe. I have also just recently purchased (not yet received) two Minimonitor ¹²⁵ Contamination Monitors from Atomic Products Corporation. These monitors are capable of detecting 0.002 uCi ¹²⁵-I surface contamination.

8) Knowledge and ability sufficient to evaluate the need for shielding ...

I was responsible for designing and building numerous new shielding devices for several investigators laboratories. Although all of these devices were built from conventional plexiglass or lead, or combinations of both, I am familiar with many of the more modern composite materials (borated polyethylene, lead polyethylene, lithium polyethylene, boro-silicone, acrylic-lead) and their individual specific applications.

9) Knowledge and ability sufficient to calculate radioactive decay ...

I have covered most of the calculations relating to radioactive materials and radiation safety in Dr. Heath's and NIH radiation safety courses. My working experience at NEOUCOM has given me ample opportunity to perform various calculations on a frequent basis. The only calculations I have not routinely performed to date are secular and transient equilibrium equations, although I fully understand their applications and can perform their calculation when necessary.

10) Knowledge and ability sufficient to calculate radiation doses.

Dr. Heath's radiation safety course and NEOUCOM's on the job training have involved calculations of various types of external doses. Although my internal dose calculations to date have been limited to bioassay measurements for 3-H, 125-I, and 131-I, NEOUCOM's radiation safety office and library contain numerous health physics books outlining necessary calculations in detail.

11) Knowledge of personnel monitoring devices and the ability to select ...

NEOUCOM contracts with R. S. Landauer, Jr. & Company for a complete monthly film badge service. Landauer offers a wide selection of badge types for varying applications.

12) Knowledge and ability sufficient to manage or conduct a training program.

To date, Dr. Heath has conducted a formal course in radiation safety at Kent State University. The majority of users have taken his course before working with radioisotopes at NEOUCOM. He will continue to offer this course on an annual basis. Additionally, beginning in July of this year, Dr. Kenneth Rosenthal, chairman of the Radiation Safety Committee, and I will be conducting in house training programs for all new users. We will also be holding in house workshops to update all present users and ancillary staff personnel. Attendance at these workshops will be mandatory.

13) Knowledge and ability sufficient to recognize and anticipate problems ...

Since joining the safety programs in spring of 1982, I have been instrumental in identifying and correcting several problem areas within the college dealing with both radiation and general occupational safety. I am a member of both the General Safety and Radiation Safety Committees, and work closely with NEOUCOM's administration in dealing with these issues.

14) Knowledge and ability sufficient to recognize criticality problems ...

Although criticality problems are not applicable to our program due to the radioisotopes presently being used, I have had some specific training at workshops in dealing with this issue.

15) Knowledge of current radioactive effluent treatment methods, equipment ...

I believe I am very knowledgeable in this area. The workshops offered by Nuclear Energy Waste Management Consultants, US Ecology, and ERM Midwest, have had sessions devoted entirely to this subject.

16) Knowledge and ability to recognize and control contamination ...

Since May of 1982, I have been responsible for all laboratory and personnel monitoring at NEOUCOM. This responsibility entails the identification of contamination problems as well as supervising, and when necessary, performing decontamination procedures.

17) Knowledge and ability sufficient to prepare an emergency plan ...

Dr. Heath, the Radiation Safety Committee, and I worked together in developing NEOUCOM's present emergency procedures. These procedures utilize the principle investigator, the Radiation Safety Office and Committee, the Security Office, and if necessary, the Health Physics department at Robinson Memorial Hospital (Ravenna, Ohio; about 5 miles away).

18) Knowledge and ability to evaluate, select, and use respiratory ...

To date, routine use of respiratory equipment has rarely been needed due to the levels of radionuclides used and the laboratories and hoods they are restricted to. The college does possess several types of respirators which are available if needed; half facepiece, full facepiece, and pressure demand full facepiece respirators. I also recently attended a special respiratory protection workshop given by MSA Company at the All Ohio Safety Congress in Columbus, Ohio.

19) Knowledge and ability to evaluate, select and use protective clothing ...

I believe I am very knowledgeable in the selection and use of protective clothing not only for radioactive materials but also for carcinogenic and viral biohazards in general.

20) Knowledge and ability sufficient to evaluate, use ... gloveboxes and hoods.

One of the first needs I addressed in 1982 was the refurbishing of the glovebox and hood in the iodination laboratory. As Institutional Safety Officer and Assistant RSO, I continually monitor and evaluate all hoods and associated procedures at NEOUCOM, radiologic as well as biohazards. I am currently working with the Vice Provost and Buildings and Grounds Superintendent on the purchase of several new hoods for particular labs.

21) Knowledge and ability sufficient to evaluate and test sealed sources ...

We currently have a very small inventory of sealed sources, mostly beta and gamma counting standards. We have one ^{63}Ni sealed source in a detector for an HPLC unit. All sealed sources are wipe tested at 6 month intervals.

22) Knowledge and ability to evaluate and dispose of radioactive waste ...

This is the area where I have had the most training. The majority of the workshops I have attended dealt with radioactive waste, waste management, regulatory compliance, and waste disposal. I have personally handled all radioactive waste collection, packaging, decay, and disposal since May 1982. The NEOUCOM is also a member of ORMUG (Ohio Radioactive Materials User's Group) which was instrumental in political efforts to get Ohio to join the Midwest

Interstate Compact.

23) Working knowledge of transport regulations and requirements ...

The workshops which were sponsored by Nuclear Energy Waste Management Consultants and US Ecology covered all applicable DOT regulations in considerable detail. The Radiation Safety Office also has a current copy of 49 CFR 100-199 on file.

24) Knowledge and ability sufficient to conduct a bioassay program.

I personally developed and instituted our present 125-I and 131-I bioassay program after discussions with Dr. Heath, the NRC, and Radiation Safety Officers at several regional universities. We also conduct 3-II bioassays in accordance with the conditions outlined in NRC regulatory guides.

25) Knowledge and ability sufficient to manage effectively the applicant's radiation safety program.

Dr. Heath and I took over the radiation safety program in spring of 1982. Since that time, I have spent approximately 20-30 hours per week of my time on radiation safety. Dr. Heath's involvement has been centered around the initial overhaul and organization of the program, as well as the supervision of the safety office. I have undeniably been the actual individual responsible for the day to day working of the radiation safety program, and the contact person faculty and staff are accustomed to working with. I believe I am very qualified to handle our particular program, and have the full support of NEDUCOM's administration and safety committees. I would be happy to furnish you with any other materials deemed necessary to reach your decision.

Respectfully submitted,

Michael D. Powell

Formal Training in Radiation Safety

Michael D. Powell

Assistant Radiation Safety Officer

	Where Trained (Person or Institution)	Duration of Training	Dates of Training
Principles and practices of radiation protection.	National Institutes of Health	1 day	4/1/82
	Kent State University / NEOUCOM	1 semester	9/82-12/82
Radioactivity measurement standardization and monitoring techniques and instruments.	Kent State University	1 semester	9/82-12/82
	NEOUCOM	4/82 to present	
Mathematics and calculations basic to the use and measurement of radioactivity.	Kent State University	1 semester	9/82-12/82
	NEOUCOM	4/82 to present	
Biological effects of radiation	Kent State University	1 semester	9/82-12/82
	NEOUCOM	4/82 to present	
<u>Additional training and workshops</u>			
Radioactive Wastes and Regulatory Compliance Workshop	Washington, D.C. Sponsored by Nuclear Energy Waste Management Consultants and US Ecology	3 days	8/82
Packaging and Transportation of Radioactive Waste Materials	Philadelphia, PA Sponsored by US Ecology	3 days	9/83
All-Ohio Safety Congress and Exhibit	Columbus, Ohio Sponsored by the Ohio Department of Health	3 days	4/84
Midwest Workshop on Low Level Radioactive Waste Management: LLW Management In Transition	Columbus, Ohio Sponsored by ERM Midwest, Inc., and Ohio Department of Health	3 days	5/84
Occupational Safety Management	Chicago, Illinois Sponsored by National Safety Council	5 days	6/84