

FORM NRC-313.1
(6-78)
18 CFR 30

NUCLEAR REGULATORY COMMISSION

NEW LHA
1. APPLICATION FOR
(Check and/or complete as appropriate)
12-20084-01
030-17943 1/26-2-3

APPLICATION FOR BYPRODUCT MATERIAL LICENSE
INDUSTRIAL

X a. NEW LICENSE
b. AMENDMENT TO
LICENSE NUMBER
c. RENEWAL OF
LICENSE NUMBER

See attached instructions for details.

Completed applications are filed in duplicate with the Division of Fuel Cycle and Material Safety, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555 or applications may be filed in person at the Commission's office at 1717 H Street, NW, Washington, D. C. or 7915 Eastern Avenue, Silver Spring, Maryland.

2. APPLICANT'S NAME (Institution, firm, person, etc.)

Illinois Department of Nuclear Safety
TELEPHONE NUMBER AREA CODE - NUMBER EXTENSION
217/546-8100

3. NAME OF PERSON TO BE CONTACTED REGARDING THIS APPLICATION

George M. McCann
TELEPHONE NUMBER AREA CODE - NUMBER EXTENSION
217/546-8100

4. APPLICANT'S MAILING ADDRESS (Include Zip Code)

1035 Outer Park Drive
Springfield, Illinois 62704

5. STREET ADDRESS WHERE LICENSED MATERIAL WILL BE USED (Include Zip Code)

See Attachment A

(IF MORE SPACE IS NEEDED FOR ANY ITEM USE ADDITIONAL PROPERLY KEYED PAGES.)

6. INDIVIDUAL(S) WHO WILL USE OR DIRECTLY SUPERVISE THE USE OF LICENSED MATERIAL
(See Items 16 and 17 for required training and experience of each individual named below)

FULL NAME		TITLE
a. George M. McCann		Radiation Safety Officer
b. See Attachment B for Users Statement		
c.		
7. RADIATION PROTECTION OFFICER		Attach a resume of person's training and experience as outlined in Items 16 and 17 and describe his responsibilities under Item 15.
Same as Item 6.a.		

B LICENSED MATERIAL

LINE NO.	ELEMENT AND MASS NUMBER	CHEMICAL AND/OR PHYSICAL FORM	NAME OF MANUFACTURER AND MODEL NUMBER (If Sealed Source)	MAXIMUM NUMBER OF MILLICURIES AND/OR SEALED SOURCES AND MAXIMUM ACTI- VITY PER SOURCE WHICH WILL BE POSSESSED AT ANY ONE TIME
	A	B	C	D
(1)	See Attachment C			
(2)				
(3)				
(4)				

DESCRIBE USE OF LICENSED MATERIAL

(1) See Attachment C

(2)

(3)

(4)

FORM NRC 313 (6-78)

Rec'd

JUN 22 1981

Control No. 04298

9. STORAGE OF SEALED SOURCES			
LINE NO.	CONTAINER AND/OR DEVICE IN WHICH EACH SEALED SOURCE WILL BE STORED	NAME OF MANUFACTURER	MODEL NUMBER
	A	B	C
(1)	Sealed source will be stored in the	Sources limited to	
(2)	same containers provided by the	dose calibrator, and	
(3)	manufacturer or of a type equally	survey instrument cali-	
(4)	suitable.	bration sources.	

10. RADIATION DETECTION INSTRUMENTS						
LINE NO.	TYPE OF INSTRUMENT	MANUFACTURER'S NAME	MODEL NUMBER	NUMBER AVAILABLE	RADIATION DETECTED (alpha, beta, gamma, neutron)	SENSITIVITY RANGE (mR/hr or counts/minute)
	A	B	C	D	E	F
(1)	(See Attachment D)					
(2)						
(3)						
(4)						

11. CALIBRATION OF INSTRUMENTS LISTED IN ITEM 10

☐ CALIBRATED BY SERVICE COMPANY

NAME, ADDRESS, AND FREQUENCY

☒ CALIBRATED BY APPLICANT

Attach a separate sheet describing method, frequency and standards used for calibrating instruments.

In accordance with U.S.N.R.C. Regulatory Guide 10.8 (See Attachment D)

12. PERSONNEL MONITORING DEVICES		
TYPE (Check and/or complete as appropriate.)	SUPPLIER (Service Company)	EXCHANGE FREQUENCY
	A	C
<input checked="" type="checkbox"/> (1) FILM BADGE <input type="checkbox"/> (2) THERMOLUMINESCENCE DOSIMETER (TLD) <input type="checkbox"/> (3) OTHER (Specify): _____	R.S. Landauer and Company - Whole Body	<input checked="" 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. Attachment E

☒ 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 _____

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 Waste will either be by decay, return to manufacturer or to a U.S.N.R.C. approved waste disposal agency.

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:

(See Attachment F & G - Radiation Protection Program)

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 - State Agency

(1) LICENSE FEE CATEGORY:

(2) LICENSE FEE ENCLOSED \$

b. CERTIFYING OFFICIAL Signature

c. NAME (Type or print)

Philip F. Gustafson

d. TITLE
Acting Director

e. DATE

ATTACHMENT A

ILLINOIS DEPARTMENT OF NUCLEAR SAFETY

Item 5

- a. Dose calibrator and nuclear medicine sealed sources will be used at temporary job sites throughout the State of Illinois.
- b. Sealed sources used for calibration of radiation survey instrumentation will be at, 535 West Jefferson Street, Springfield, Illinois, which is the IDNS Emergency Response Storage Facility and at 525 West Jefferson Street, Springfield, Illinois, which is the IDNS-NBS Calibration Facility.
- c. Preparation and processing of radiochemical standards, analysis of environmental and leak test samples will be performed at the Illinois Department of Public Health Laboratory, 134 North 9th Street, Springfield, Illinois, under authorization of their NRC License #12-08948-01.
- d. Analyses of contained environmental samples will be conducted in IDNS mobile laboratory at temporary job sites throughout the State of Illinois.

ATTACHMENT B

ILLINOIS DEPARTMENT OF NUCLEAR SAFETY

Item 6.b.

Radioactive materials will be used by, or under the supervision of George M. McCann, Radiation Safety Officer, or other individuals, who are classified as a Health Physicist II or above. Radiation Safety Officer's resume and minimum requirements for a Health Physicist II are attached.

Any individual classified less than Health Physicist II, will be certified by the IDNS Director and RSO, to have equivalent experience prior to being authorized to use licensed radioactive materials.

Statement of Training

 1. Name of Applicant George M. McCann

 Department Illinois Department of Nuclear Safety

Type	2. Type of Training		Formal Course	On-the-Job
	Where Trained by Who	Duration of Training		
a) Principles and Practices of Radiation Protection	Univ. of Iowa IDNS Oak Ridge Assoc Universities	2 years 11 years 10 weeks	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
b) Radioactivity measurement, monitoring techniques and instruments	(See Resume Attached) " "		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
c) Mathematics and Calculations Basic to the use and measurement of radioactivity and x-ray.	" "	" "	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
d) Biological effects of Radiation.	" "	" "	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

3. Experience (Actual Use of Isotopes)				
Isotope	Maximum Amount	Where Experience Gained	Duration	Type of Use or Formal Courses
Ra ²²⁶	~15 mCi	Illinois Department of Nuclear Safety	4 years	Calibration of Radiation Detection & Measurement Instruments
Ra ²²⁶	several hundred millicuries	IDNS and at Licensee facilities	11 years	Have disposed ~500 mCi of Ra ²²⁶ to US EPA personally — through inspection of IDNS licensees
Cs ¹³⁷ , Ba ¹³³ , Co ⁶⁰ , Cr ⁵¹ , etc	millicurie amounts	IDNS	4 year	Dose Calibrator source — recently provide through BRL contract & at licensee facilities
various other sealed sources & unsealed materials	millicurie amounts to curies	Oak Ridge Assoc. Universities IDNS	4 years	10 week Health Physics Course & preparation of samples for analyses
Ir ¹⁹² , Co ⁶⁰ , etc		NRC Industrial Radiography Course and other NRC Courses		also through participation during inspection of licensee

4. Experience (Actual Use of X-ray Equipment)

Type of X-ray Equipment	Where Experience Gained	Duration	Type of Use or Formal Course
Medical X-Ray Equipment	Univ. of Iowa IDNS	2 yrs 7 years	X-Ray Technology inspection of Registrants
Sony Industrial & analytical	IDNS	7 years	inspection of Registrants

Statement of Agreement: The below named individual signifies he has read and is willing to abide by the Illinois Department of Public Health's Rules and Regulations for the Protection Against Radiation governing use of radioisotopes and other sources of ionizing radiation. The undersigned agrees to comply with all such rules and regulations.

Date December 23, 1980

Signed George W. W. Carter

0126A/2148C

RESUMENAME:

George M. McCann

ADDRESS:OFFICE ADDRESS:[]
Illinois Department of Public Health
Division of Radiation Protection
535 West Jefferson
Springfield, Illinois 62761DATE OF BIRTH:MARITAL STATUS:EDUCATION:

1980 US NRC, Industrial Radiography Course, Baton Rouge, Louisiana - 1 week.

1980 Federal Emergency Management Agency, Federal Interagency Course for Radiological Emergency Response Coordinators, Iowa City, Iowa, 1 week.

1980 Nuclear Regulatory Commission, "Well Logging Course", Houston, Texas, 1 week.

1979 USDOE, "Radiation Accident Management", Oak Ridge, Tenn., 1 week.

1979 Reynold Electrical & Engineering Co., Inc. Sponsored by USNRC, Radiological Emergency Response Operation, Las Vegas, NV., 2 weeks.

1979 BRH, "Nuclear Medicine Quality Assurance", Rockville, MD., 3 days.

1978 Nuclear Regulatory Commission, Radioactive Material Compliance Inspection Course, Glen Ellyn, IL, 1 week.

1978 USNRC, Health Physics and Radiation Protection, Oak Ridge, Tennessee, 10 weeks.

1977 Nuclear Regulatory Commission, Radioactive Material Licensing Course, Washington, D.C., 2 weeks.

Exemption

EDUCATION (cont.)

1976 Mercy Center for Health Care Services,
Emergency Medical Technician Course, Aurora,
IL., 16 weeks. Certified by the Illinois
Department of Public Health on June 30, 1976.

1976 Food and Drug Administration Region 5,
Advanced Radiological Science Workshop, Rush
Presbyterian-St. Luke's Medical Center,
Chicago, IL.

1975 Nuclear Regulatory Commission, Medical Uses
of Radionuclides for State Regulatory
Personnel, Huston, Texas, 1 week.

1973-1975 Aurpra College, Aurora, IL
Degree Awarded: Bachelor of Arts
Received May 1975
Majors: Biology and Psychology

1970-1971 Waubonsee Community College, Sugar Grove, IL.

1970 U.S. Department of Health, Education &
Welfare, Basic Radiological Health Course,
Washington D.C., 2 weeks.

1967-1969 University of Iowa Hospitals & Clinics,
Roentgenologic Technique, Iowa City, Iowa.
24 month program awarded Certificate of
Roentgenologic Technique, also received
American Certificate of Technology,
(American Registry of Radiologic Technology).

1966-1967 Southwestern Community College, Creston,
Iowa.

Summer 1967 University of Iowa, Iowa City, Iowa.

1962-1966 Greenfield Community High school,
Greenfield, Iowa.

EXPERIENCE:

April 1978 to
Present:

12/18/80 designated RSO of the Ill Dept of Nuclear Safety

Advanced to the head of the Radioactive
Material Compliance Section. Responsible
for the supervision of state-wide field
staff, and reportable to the Chief of the
Division of Radiation Protection. Promoted
to Health Physicist III in October, 1978.
Appointed Radiation Safety Officer on
April 18, 1980 by the Director of Public
Health.

June 1977 to
April 1978:

Promoted to Health Physicist II and transferred to Springfield Administrative Offices, Radioactive Material Compliance Section. Assistant to the Compliance Section head. Responsible for the review of reports, letters and training of field staff. Responsibilities involved the participation as a team member of the Illinois Radiological Emergency Response Team, the calibration of radiation survey instruments and also assisting in the review and issuance of radioactive material licenses.

May 1974 to
June 1977:

Promoted to Health Physics Technician III. Regional Representative in charge of a 17 county area region. Responsible for the inspection of all medical and industrial facilities utilizing x-ray equipment, also responsible for the inspection of licensed facilities that utilize radioactive materials. Necessitated the preparation of detailed reports, maintenance of work load statistics used in management by objectives, program review of facilities with regard to structured design and methods of operation. Duties also involved lecturing at local community colleges and hospitals.

EXPERIENCE: (cont.)

January 1972 to
May 1974:

Promoted to Health Physics Technician II. Regional Representative responsible for the inspection of industrial, medical and dental facilities utilizing x-ray equipment within an 8 county region. Necessitated preparation of survey reports and scheduling of surveys on an independent work status. Required consultation with medical and administrative personnel with regard to practices and plans for the improvement of radiological health programs.

October 1969 to
January 1972:

Illinois Department of Public Health, employed as a Health Physics Technician I. Regional Representative working under supervision and responsible for the inspection of medical, veterinary, and dental facilities with x-ray equipment located in 3 counties of a 7 county region. Prepared routine survey reports and necessary compliance letters.

October 1967 to
October 1979:

University of Iowa Hospitals & Clinics, Iowa City, Iowa. Student x-ray technologist actively involved in the study of x-ray technology, also included limited study in the field of nuclear medicine and radiation therapy.

AFFILIATIONS:

Conference of Radiation Control Program Directors

Illinois Public Health Association

AWARDS:

1972

Governor's Award for Superior Achievement

1975

Chief of Police Association, Certificate of Merit, "For Saving A Life."

APPOINTMENTS:

1979

Appointed to Task Force 2B "Criteria for adequate Control program - Radioactive Material" by Conference of Radiation Control Program Directors, Inc.

ADDITIONAL
EXPERIENCE

August 1979
to Present:

Member of Athens Volunteer Fire Department. Necessitated receiving training in modern fire fighting techniques and equipment.

October 1977
to May 1978:

Employed by the Athens Police Department on a part-time basis, as a commissioned patrolman. Involved in all aspects of police service.

June 1971
to July 1977:

Employed part-time by the Kendall County Sheriff's Department. Initial 8 month probationary period of on-the-job training as a deputy trainee. Training involved basic civil and criminal law, arrest and search procedures, crowd and traffic control, and police report writing.

Advanced to patrolman status were operations of police radio communication center, and jail operations. Communications functions and training included operating county radio network, Law Enforcement Advance Data System, LEADS, computer terminal and police records maintenance. Jail training and functions included all aspects of prisoner booking procedures, such as finger printing, photography and custodial care of inmates. I was also required to attend a 3-4 hour Sheriff's meeting once a month and 1-2 hour firearm qualification every two months.

January 1971
to June 1971:

Participation in 13 week course, Law and Order Training for Civil Defense Emergency. Sponsored by the Aurora Civil Defense Auxiliary Police, and taught by the Aurora Police Department. Functions after completion of the course basic were reportlwriting, traffice and crowd control.

wm:3344C

HEALTH PHYSICIST II

DISTINGUISHING FEATURES OF WORK:

Under general supervision performs various tasks selected to increase professional competence in health physics; makes surveys of areas where some problems of a nonroutine nature will be encountered; performs analysis using standard methods to determine nature and amount of radioisotopes present in a variety of materials; calibrates a variety of radiation instruments; investigates and evaluates radiological hazards and recommends protective measures when the problems involve standard solutions; determines shielding requirements for conventional experiments with a particle accelerator or nuclear reactor.

ILLUSTRATIVE EXAMPLES OF WORK:

1. Conducts field investigations in registered and licensed radiation installations to evaluate hazards associated with the use of sources of radiation.
2. Prepares inspection reports and correspondence containing information for compliance with appropriate laws, rules and regulations.
3. Conducts field surveys to evaluate contamination from radioactive materials, evaluating concentration of radioactive materials, and recommending decontamination measures.
4. Uses radiation detection instruments to identify radiation hazards; performs calibration of all types of radiation instruments.
5. Performs analyses of radioisotopes in the radiological laboratory and relates results to public health radiation hazards.
6. Reviews plans, and specifications for approval of designs for the application of biological shielding.
7. Performs calculations, including the biological dose to various body organs from isotopes.
8. Performs other duties as required or assigned.

HEALTH PHYSICIST II

DESIRABLE REQUIREMENTS:

Education

Requires knowledge, skill and mental development equivalent to completion of four years of college with courses in biology, chemistry and physics.

Experience

Requires one year professional experience in the practice of health physics.

Requires working knowledge of the basic principles and practices of health physics.

Requires working knowledge of the physical and chemical properties of radiation.

Requires working knowledge of the biological and physical effects of radiation.

Requires working knowledge of the operation of radiation instruments.

Significant Responsibilities

Requires ability to perform investigations involving the practical and theoretical application of health physics.

Requires ability to prepare technical reports of investigation.

Requires ability to evaluate the safety aspects in radiation facilities.

Requires ability to make calculations involving the application of health physics practices.

Requires ability to review and interpret plans and specifications for proposed radiation installations.

Requires ability to operate an automobile.

ATTACHMENT C

ILLINOIS DEPARTMENT OF NUCLEAR SAFETY

Item 8

1.A.	Any by-product material, atomic number 3-83, inclusive	1.B.	Sealed Source	1.C.	40 milli-curies
2.A.	Any by-product material, atomic number 3-83, inclusive	2.B.	Environmental and effluent samples	2.C.	Total activity not to exceed 1000 millicuries
3.A.	Any by-product material, atomic number 3-83 inclusive	3.B.	Any	3.C.	Total activity not to exceed 1000 millicuries
4.A.	Any by-product material, atomic numbers 3-83 inclusive	4.B.	Any	4.C.	As a contaminant on a leakage/contaminant test sample
5.A.	Any by-product material, 1-83 inclusive	5.B.	Any	5.C.	Total activity not to exceed 100 Curies
6.A.	Any by-product material, 3-83 inclusive	6.B.	Sealed Sources	6.C.	Total activity not to exceed 20 millicuries
7.A.	Hydrogen 3	7.B.	Environmental and effluent samples	7.C.	Total activity not to exceed 500 milli-curies
8.A.	Xenon 133	8.B.	Free gas in single unit vials	8.C.	Total activity not to exceed 80 milli-curies

ATTACHMENT C (Cont'd)

ILLINOIS DEPARTMENT OF NUCLEAR SAFETY

9.A. Plutonium 239	9.B. Plated Sources (Eberline source set, model S94-2 serial numbers P-798,, P-848, P-800 and source set model DNS-1, serial number P-6700)	9.C. Total activity not to exceed 192 microcuries
10.A. Thorium	10.B. Any form environmental samples	10.C. _____

AUTHORIZED USE:

1. Calibration sources provided by the National Bureau of Standards, to be used for the calibration of radiation survey instrumentation at the IDNS, NBS calibration facility.
2. Environmental and effluent samples for analysis.
3. To be used in and in preparation of working reference standards for radiochemical analysis.
4. Testing of sealed sources for leakage and/or contamination.
5. Temporary authorization for the possession of any by-product material incident to a health hazard investigation, and where the licensee/owner of the by-product material fails to take immediate action necessary to prevent injury to the public or employees of the licensee. Possession of any by-product material shall be temporary, until such time that transfer to an authorized recipient or owner approved by the U.S.N.R.C. has been accomplished. (See Attachment E for calculation pertinent to shipping container limitation.) The Illinois Department of Nuclear Safety under the authority of Illinois Radiation Protection Act, Section 12 "Authority of Department in Cases Constituting an Immediate Threat to Health" is authorized to take whatever steps necessary to remediate the hazard. A copy of the Illinois Radiation Protection Act is attached.
6. To be used in the calibration and testing of dose calibrators and nuclear medicine imaging systems related to state licensing and inspection of NARM (natural occurring and accelerator produced radioactive materials).
7. For use as working and reference standards and as environmental effluent samples for tritium analyses.

ATTACHMENT C (Cont'd)

ILLINOIS DEPARTMENT OF NUCLEAR SAFETY

8. To be used in the calibration and testing of dose calibrators, related to state licensing and inspection of NARM (natural occurring and accelerator produced radioactive materials).
9. To be used in the calibration of alpha radiation survey instruments.
10. Environmental samples for analyses.

RADIATION PROTECTION ACT

AN ACT relating to radiation protection and prescribing functions, powers and duties relating to the regulation of the uses of sources of ionizing radiation which are or may be detrimental to health; and authorizing the Governor on behalf of the State to enter into an agreement with the Federal Government. Approved July 17, 1959. L.1959, p. 1512. Title as amended by act approved Aug. 16, 1963. L.1963, p. 3020.

Be it enacted by the People of the State of Illinois, represented in the General Assembly:

211. § 1. Title.) This Act shall be known and may be cited as the "Radiation Protection Act."

212. § 2. Public policy.) Whereas ionizing radiations and their sources can be instrumental in the improvement of the health and welfare of the public if properly utilized, and may be destructive or detrimental to life or health if carelessly or excessively employed or may detrimentally affect the environment of the State if improperly utilized, it is hereby declared to be the public policy of this State to encourage the constructive uses of radiation and to prohibit and prevent exposure to ionizing radiation in amounts which are or may be detrimental to health. It is further the policy to advise, consult and cooperate with other agencies of the State, the Federal Government, other States and interstate agencies and with affected groups, political subdivisions and industries; and, in general, to conform as nearly as possible to nationally accepted standards in the promulgation and enforcement of codes, rules and regulations.

212a. § 2a. Purpose.) It is the purpose of this Act to effectuate the policies set forth in Section 2 by providing for:

(1) a program of effective regulation of radiation sources for the protection of human health, welfare and safety;

(2) a program to promote an orderly regulatory pattern within the State, among the States and between the Federal Government and the State and facilitate intergovernmental cooperation with respect to use and regulation of sources of ionizing radiation to the end that duplication of regulation may be minimized;

(3) a program to establish procedures for assumption and performance of certain regulatory responsibilities with respect to by-product, source and special nuclear materials; and

(4) a program to permit maximum utilization of sources of ionizing radiation consistent with the health and safety of the public. Added by act approved Aug. 16, 1963. L.1963, p. 3020.

Section 212 of this chapter.

213. § 3. Definitions.) The words and phrases used in this Act shall have the meanings set forth in Sections 3.1 to 3.13, inclusive.¹ Resectioned and amended by act approved Aug. 24, 1965. L.1965, p. 3668.

¹ Sections 213.1-213.13 of this chapter.

213.1 By-product material.] § 3.1 "By-product material" means any radioactive material (except special nuclear material) yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material. Added by act approved Aug. 24, 1965. L.1965, p. 3668.

213.2 Department.] § 3.2 "Department" means the Department of Public Health in the State of Illinois. Added by act approved Aug. 24, 1965. L.1965, p. 3668.

213.3 Director.] § 3.3 "Director" means the Director of the Department of Public Health. Added by act approved Aug. 24, 1965. L.1965, p. 3668.

213.4 General license.] § 3.4 "General license" means a license, pursuant to regulations promulgated by the Department, effective without the filing of an application to transfer, acquire, own, possess or use quantities of, or devices or equipment utilizing by-product, source or special nuclear materials. Added by act approved Aug. 24, 1965. L.1965, p. 3668.

213.5 Person.] § 3.5 "Person" means any individual, corporation, partnership, firm, association, trust, estate, public or private institution, group, agency, political subdivision of this State, any other State or political subdivision or agency thereof, and any legal successor, representative, agent, or agency of the foregoing, other than the United States Atomic Energy Commission, or any successor thereto, and other than federal government agencies licensed by the United States Atomic Energy Commission, or any successor thereto. Added by act approved Aug. 24, 1965. L.1965, p. 3668.

213.6 Radiation—ionizing radiation.] § 3.6 "Radiation" or "ionizing radiation" means gamma rays and X-rays, alpha and beta particles, high speed electrons, neutrons, protons, and other nuclear particles; but not sound or radio waves, or visible, infrared or ultraviolet light. Added by act approved Aug. 24, 1965. L.1965, p. 3668.

213.7 Radiation installation.] § 3.7 "Radiation installation" is any location or facility where radiation machines are used or where radioactive material is produced, transported, stored, disposed of or used for any purpose. Added by act approved Aug. 24, 1965. L.1965, p. 3668.

213.8 Radiation machine.] § 3.8 "Radiation machine" is any device that produces radiation when in use. Added by act approved Aug. 24, 1965. L.1965, p. 3668.

213.9 Radioactive material.] § 3.9 "Radioactive material" means any solid, liquid or gaseous substance which emits radiation spontaneously. Added by act approved Aug. 24, 1965. L.1965, p. 3668.

213.10 Radiation source—Source of ionizing radiation.] § 3.10 "Radiation source" or "source of ionizing radiation" means a radiation machine or radioactive material as defined herein. Added by act approved Aug. 24, 1965. L.1965, p. 3668.

213.11 Source material.] § 3.11 "Source material" means (1) uranium, thorium, or any other material which the Department declares by order to be source material after the United States

partment shall adopt Rules and Regulations for:

- (1) The issuance of licenses;
- (2) The utilization, manufacture and distribution of such radioactive materials or devices or equipment utilizing or producing such materials, and
- (3) The amendment, suspension or revocation of licenses.

The Department may, by Rule and Regulation, exempt certain sources of radiation or kinds of radiation or users from the licensure and fee requirements of this Section when the Department makes a finding that such exemption will not constitute a significant risk to the health and safety of the public. State and Federal agencies are exempt from the licensure and fee requirements of this Section, however, State Departments or Agencies using or possessing such sources of radiation are required to be registered. Educational institutions shall be subject to licensure, but are exempt from fee requirements of this Section.

Applications for licenses shall be made upon forms prescribed and furnished by the Department and shall be accompanied by the fees provided herein. Licenses shall expire one year from issuance. Applications for licenses for subsequent years shall be made thirty days prior to expiration date.

The annual application fee for the use of such radioactive materials shall be \$50.00. The annual application fee for manufacturers and/or distributors of such radioactive materials or devices or equipment utilizing or producing such materials shall be \$100.00.

The Department shall assign an annual date to each applicant which shall be applicable to all licenses required to be issued to the applicant. The Department may issue licenses or additional licenses to an applicant for a period of six months or less and the fee for each period shall be one-half of the required application fee.

Each application fee shall be paid to the Department by separate certified check or United States money order in amount of the application fee only and any application fee or any part thereof, once paid shall not be refunded.

This Section shall not apply to any x-ray machine including those located in an office of a licensed physician or dentist.

Added by P.A. 78-728, § 1, eff. Oct. 1, 1973.

217. § 7. Radiation Protection Advisory Council.) There shall be created a Radiation Protection Advisory Council consisting of 7 members to be appointed by the Governor on the basis of demonstrated interest in and capacity to further the purposes of this Act and who shall broadly reflect the varied interests in and aspects of atomic energy and ionizing radiation within the State. The Director of the Department of Labor and the Chairman of the Commerce Commission or their representatives shall be ex-officio members of the Council.

Members of the Council shall be appointed for 4 year terms, except that, of the initial members the terms of 2 shall expire at the end of the first year, 2 at the end of the second year, and 3 at the end of the third year. Any member appointed to fill a vacancy occurring prior to the expiration of the term for which his predecessor was appointed shall be appointed for the remainder of such term. The Chairman of the Council shall be selected by and from the Council membership. The Council members shall serve without compensation but shall be reimbursed for their actual expenses incurred in line of duty. The Council shall meet as often as

the Chairman deems necessary, but upon request of 4 or more members it shall be the duty of the Chairman to call a meeting of the Council.

It shall be the duty of the Council to assist in the formulation of and to review the policies and programs of the Department as developed under authority of this Act and to make recommendations thereon and to provide the Department with such technical advice and assistance as may be requested. The Council may employ such professional, technical, clerical and other assistants, without regard to the civil service laws or the "Personnel Code" of this State, as it deems necessary to carry out its duties.

Chapter 127, § 43101 et seq.

218. § 8. Functions and powers of Department.) The Department shall administer this Act and promulgate by codes, rules, regulations, or orders such standards and instructions to govern the possession and use of any radiation source as the Department may deem necessary or desirable to protect the public health, welfare and safety. Resectioned and amended by act approved Aug. 24, 1965. L.1965, p. 3670.

218.1 Policies and program.] § 8.1 The Department shall develop comprehensive policies and programs for the evaluation and determination of exposures associated with the use of radiation, and for their control. Added by act approved Aug. 24, 1965. L.1965, p. 3670.

218.2 Public hearings.] § 8.2 The Department shall hold public hearings, receive pertinent and relevant proof from any party in interest who appears before the Department, make findings of facts and determinations, all with respect to the violations of the provisions of this Act or codes, rules, regulations or orders issued pursuant thereto. Added by act approved Aug. 24, 1965. L.1965, p. 3670.

218.3 Proceedings to compel compliance.] § 8.3 The Department shall institute or cause to be instituted in a court of competent jurisdiction legal proceedings to compel compliance with the provisions of this Act or Codes, rules, regulations or orders issued pursuant thereto. Added by act approved Aug. 24, 1965. L.1965, p. 3670.

218.4 Advice, consultation, cooperation.] § 8.4 The Department shall advise, consult, and cooperate with other agencies of the State, the Federal Government, other States and interstate agencies, and with affected groups, political subdivisions, and industries. Added by act approved Aug. 24, 1965. L.1965, p. 3670.

218.5 Loans, grants, gifts.] § 8.5 The Department shall accept and administer according to law loans, grants, or other funds or gifts from the Federal Government and from other sources, public or private, for carrying out its functions under this Act. Added by act approved Aug. 24, 1965. L.1965, p. 3670.

218.6 Studies, investigations, training, research, and demonstrations.] § 8.6 The Department shall encourage, participate in, or conduct studies, investigations, training, research, and demonstrations relating to the control or measurement of radiation, the effects on health of exposure to radiation, and related problems as it may deem necessary or advisable in the discharge of its duties under this Act. Added by act approved Aug. 24, 1965. L.1965, p. 3670.

The Director shall make findings of fact in such hearing and shall render his decision within 30 days after the termination of the hearing unless additional time is required by him for a proper disposition of the matter. When the hearing has been conducted by a Hearing Officer, the Director shall review the record before rendering a decision.

Technical errors in the proceedings before the Director or Hearing Officer or the failure of the Director or Hearing Officer to observe the technical rules of evidence shall not constitute grounds for the reversal of any administrative decision unless it appears to the court that such error or failure materially affects the rights of any party and results in substantial injustice to him.

All subpoenas issued by the Director or Hearing Officer may be served as provided for in civil actions. The fees of witnesses for attendance and travel shall be the same as the fees for witnesses before the Circuit Court and shall be paid by the party to such proceeding at whose request the subpoena is issued. If such subpoena is issued at the request of the Department, the witness fee shall be paid as an administrative expense.

The Department shall not be required to certify any record or file any answer or otherwise appear in any proceeding for judicial review unless the party filing the complaint deposits with the clerk of the court the sum of 95 cents per page representing costs of such certification. Failure on the part of the plaintiff to make such deposit shall be grounds for dismissal of the action.

In cases of a refusal of a witness to attend or testify or to produce books or papers concerning any matter upon which he might be lawfully examined the Circuit Court of the county wherein the hearing is held, or the judge thereof, upon application of any party to the proceeding, may compel obedience by proceeding as for contempt of court as in cases of a like refusal to obey a similar order of such court.

A full stenographic transcript thereof, of the proceedings of said hearing shall be taken and filed with the Department.

221. § 11. Review under Administrative Review Act.) The provisions of the Administrative Review Act, approved May 8, 1945, as amended,¹ and the rules adopted pursuant thereto, shall apply to and govern all proceedings for judicial review of final administrative decisions of the Department hereunder. The term "administrative decision," is defined as in Section 1 of the Administrative Review Act.²

¹ Chapter 110, § 264 et seq.

² Chapter 110, § 264.

222. § 12. Authority of Department in cases constituting an immediate threat to health.) Notwithstanding any other provision of this Act, whenever the Department finds that a condition exists which constitutes an immediate threat to health due to the violation of any provisions of this Act or any code, rule, regulation or order promulgated under this Act and requiring immediate action to protect the public health or welfare, it may issue an order reciting the existence of such an immediate threat and the findings of the Department pertaining thereto. The Department may summarily cause the abatement of such violation or may direct the Attorney General to obtain an injunction against such violator.

Such order shall be effective immediately but shall include notice of the time and place of a public hearing before the Department to be held within 30 days of the date of such order to assure the justification of such order. On the basis of such hearing the Department shall continue such order in effect, revoke it or modify it. Any party affected by an order of the Department shall have the right to waive the public hearing proceedings.

223. § 13. Violations.) Any person who shall violate any of the provisions of, or who fails to perform any duty imposed by this Act, or who violates any determination or order of the Department, promulgated pursuant to this Act, is guilty of a Class A misdemeanor; provided each day during which violation continues shall constitute a separate offense; and in addition thereto, such person may be enjoined from continuing such violation as hereinafter provided.

The penalties provided herein shall be recoverable in an action brought in the name of the people of the State of Illinois by the Attorney General. Amended by P.A. 77-256, § 1, eff. Jan. 1, 1973.

224. § 14. Injunctive relief.) It shall be the duty of the Attorney General upon the request of the Department to bring an action for an injunction against any person violating the provisions of this Act, or violating any order or determination of the Department.

225. § 15. Conflicting laws.) This Act shall not be construed as repealing any laws of the State relating to radiation sources, exposures, radiation protection, and professional licensure, but shall be held and construed as auxiliary and supplementary thereto, except to the extent that the same are in direct conflict herewith.

No ordinances or regulations of any governing body of a municipality or county or board of health not inconsistent with this Act or any code, rules or regulations promulgated pursuant thereto shall be superseded by this Act. Nothing in this Act or in any code, rules or regulations promulgated pursuant thereto shall preclude the right of any governing body of a municipality or county or board of health to adopt ordinances or regulations not inconsistent with this Act or any code, rules or regulations promulgated pursuant thereto.

226. § 16. Existing remedies unimpaired.) No existing civil or criminal remedy for any wrongful action which is a violation of any code, rule or regulation promulgated under this Act shall be excluded or impaired by this Act.

227. § 17. Severability.) If any section, subsection, sentence, clause, phrase, or word of this Act is for any reason held to be unconstitutional, such decree shall not affect the validity of any remaining portion of this Act.

228. § 18. Protection of powers.) The powers, duties and functions vested in the Department under the provisions of this Act shall not be construed to affect in any manner the powers, duties, and functions vested in the Department under any other provisions of law.

229. [§ 19. Emergency.]

ATTACHMENT D

ILLINOIS DEPARTMENT OF NUCLEAR SAFETY
Radiation Monitoring Equipment

Equipment	Quantity
1. Emergency Response Kits (each containing the following:)	6
a. Eberline PRM-6 Pulse-Rate Meter	1
b. Eberline HP-260 Thin-Window G-M	1
c. Eberline SPA-3 2"x2" NaI Probe	1
d. Eberline AC-3 ZnS Alpha Scintillation Probe	1
e. Eberline PIC-6A, Ion Chamber (lmR/hr - 1000 mR/hr)	1
2. Emergency Response Kits (each containing the following:)	6
a. Eberline PRM-5-3 Pulse-Rate Meter	1
b. Eberline HP-260 Thin-Window G-M	1
c. Eberline SPA-3 2"x2" NaI Probe	1
d. Eberline AC-3 ZnS Alpha Scintillation Probe	1
e. Eberline PIC-6A Ion Chamber (lmR/hr - 1000 mR/hr)	1
3. Alpha Survey Instruments	
a. Eberline PAC-3G (Gas Proportional)	2
b. Eberline PAC-4G (Gas Proportional)	2
c. Eberline PAC-1 SAGA (ZnS Scintillation)	1

Equipment	Quantity
-----------	----------

4. Beta-Gamma Survey Instruments

a. Victoreen Thyac III	9
b. Eberline E-400 with Planchet Counting Stand	1
c. Eberline E-510	6
d. Eberline E-530	14
e. Eberline HP-260 Thin-Window Pancake Probes	7
f. Eberline HP-270 Energy Compensating Probes	2
g. Technical Associates PUG-1A	1
h. Nuclear Chicago, Model 2588 (Cutie Pie)	5
i. Victoreen 440RF	1
j. Technical Associates Juno	2
k. Eberline RO-1 (Cutie Pie)	9
l. Eberline RO-3 (Cutie Pie)	4
m. Eberline RO-5B (Cutie Pie)	2
n. MDH Industries Digital Ionization Meter	15
o. Victoreen Thyac II, with NaI (TI) Probe Scintillation	1

5. Neutron Survey Instruments

a. Victoreen 488	1
b. Eberline PNC-4	1
c. Eberline SPA-2 (Slow Neutron Probes)	2
d. Eberline SPA-2 (Fast Neutron Probes)	2

Equipment

Quantity

6. Special Purpose Instrumentation

- | | |
|---|---|
| a. Eberline Teletector | 1 |
| b. Victoreen Condensor-R Meters | 3 |
| c. Eberline PRS-1 (Single Channel Analyzer) | 1 |

7. Laboratory Instrumentation

- | | |
|---|---|
| a. NMC Gas Flow Proportional Counter | 1 |
| b. Beckman Low Beta II Gas Flow Proportional Counter | 1 |
| c. Nuclear Chicago Spector/Shield Gas Flow Proportional Counter | 2 |
| d. Beckman LS-100C Liquid Scintillation Counter | 2 |
| e. Nuclear Data ND-180FMR 512 Channel Multi-Channel Gamma Spectroscopy System | 1 |
| f. Canberra 8100 Computer Based 4096 Channel Ge(Li) Gamma Spectroscopy System | 1 |
| g. Nuclear Data 6610 Computer Based 4096 Channel Ge(Li) Gamma Spectroscopy System | 1 |

8. Personnel Monitoring Equipment

- | | |
|---|----|
| a. Eberline "Rad Tad" Audible Dosimeters | 13 |
| b. Reactor Experiments Audible Digital Dosimeters | 12 |
| c. Victoreen Audible Digital Dosimeters | 6 |
| d. Self-Reading Pocket Dosimeter (0-200mR) | 20 |
| e. Self-Reading Pocket Dosimeter (0-1000mR) | 20 |

ATTACHMENT D
Item II
ILLINOIS DEPARTMENT OF NUCLEAR SAFETY
CALIBRATION OF SURVEY INSTRUMENTS

Check appropriate items.

 X 1. Survey instruments will be calibrated at least annually and following repair.

 X 2. Calibration will be performed at two points on each scale.

The two points will be approximately 1/3 and 2/3 of full scale. A survey instrument may be considered properly calibrated when the instrument readings are within $\pm 10\%$ of the calculated or known values for each point checked. Readings within $\pm 20\%$ are considered acceptable if a calibration chart or graph is prepared and attached to the instrument.

 3. Survey instruments will be calibrated

 a. By the manufacturer

 X b. At the licensee's facility

(1) Calibration source

Manufacturer's name _____

Model no. Serial No. 15-10-8

Activity in millicuries 14.52 mCi

Accuracy ± 0.15 mCi

Traceability to primary standard *

 X

(2) The calibration procedures in Section I of Appendix D will be used

or

 (3) The step-by-step procedures, including radiation safety procedures, are attached.

 c. By a consultant or outside firm

(1) Name _____

(2) Location _____

(3) Procedures and sources

 have been approved by NRC and are on file in License No. _____

 are attached

* Canadian National Research Laboratories
Primary Standard Certificate # R-17466

ATTACHMENT D

ILLINOIS DEPARTMENT OF NUCLEAR SAFETY

RADIATION SAFETY PROCEDURES

Access to the IDNS calibration facilities are restricted only to authorized IDNS health physics personnel. Calibration personnel are provided with vendor film badge and TLD ring badges.

Exposure rate, source activity and shielding of the calibration facilities are known, therefore, dose to personnel may be controlled by time, distance and shielding.

During actual calibration procedures, an audible warning device is activated whenever a radiation field is present. Adjustments are done with the exposure being terminated or by removing the instrument to a field less than 5 mR/hr.

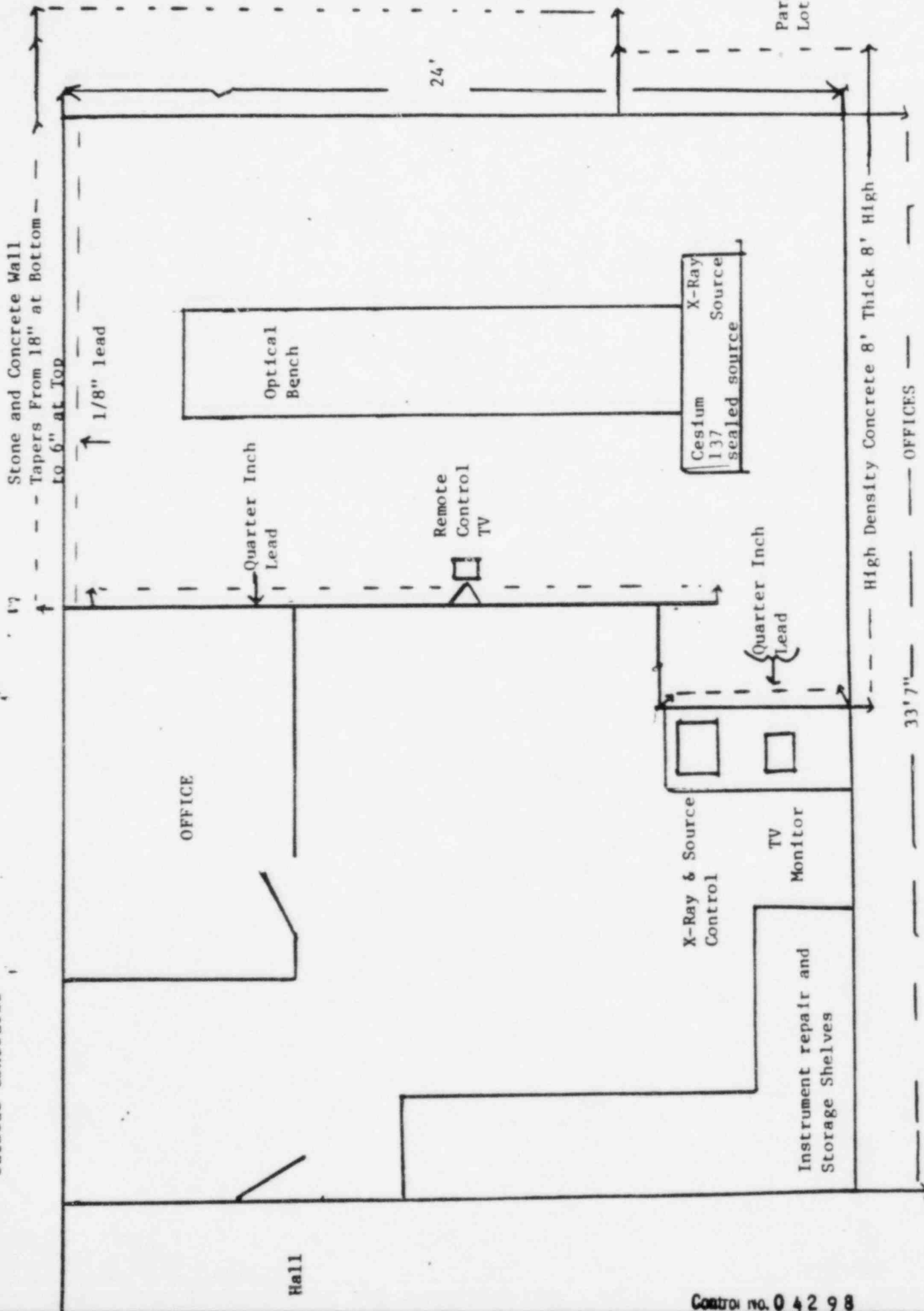
Exposure rates to unrestricted areas will be in accordance with 10 CFR 20.105. Confirmatory measurements will be performed and maintained on file.

All entrances are posted with standard radiation signs. All sealed sources are maintained in locked and secured containers when not in use.

Ceiling 6" of Concrete

ATTACHMENT E
ILLINOIS DEPARTMENT OF NUCLEAR SAFETY
NBS REGIONAL CALIBRATION LABORATORY

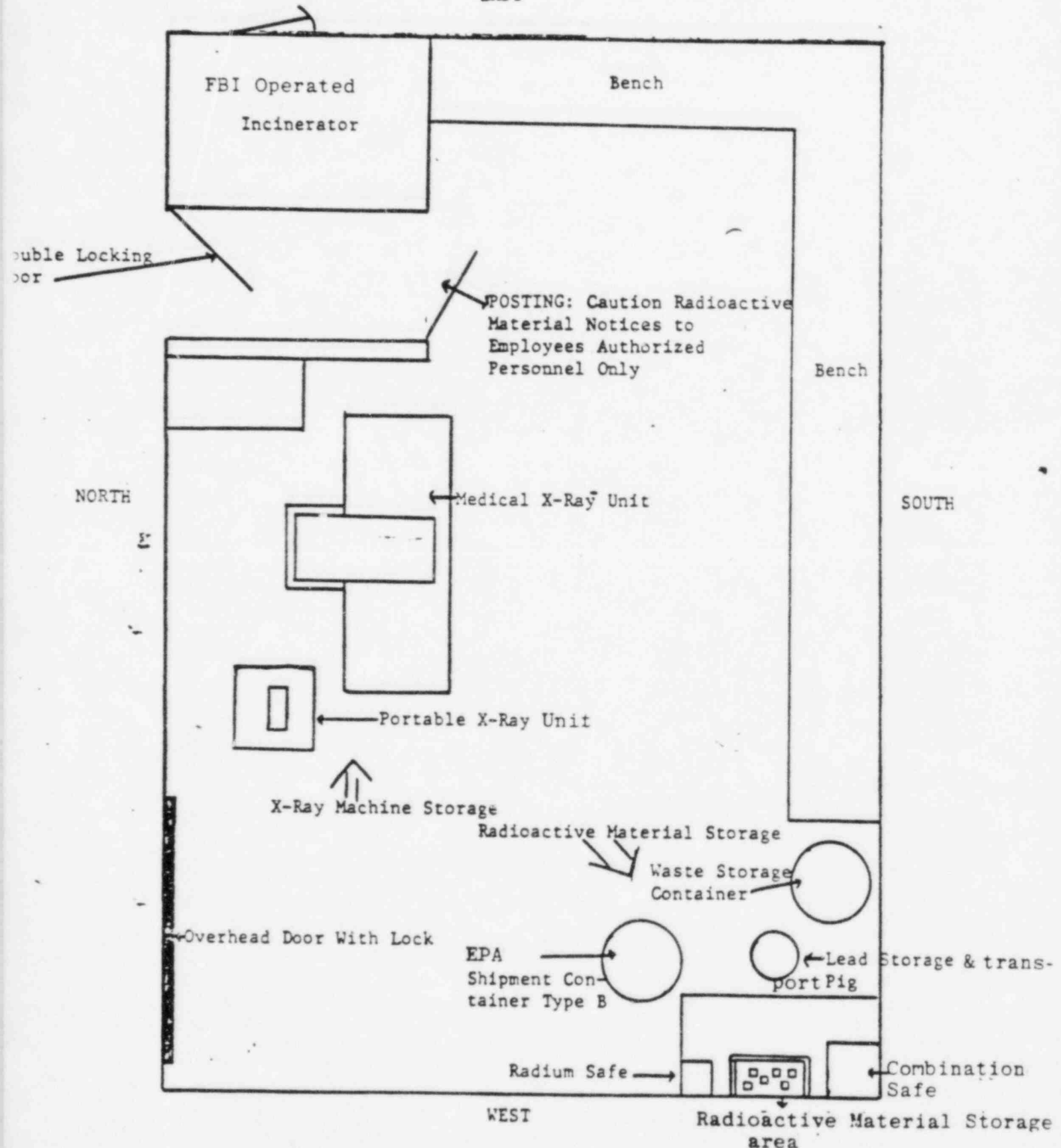
Outside Concourse



EMERGENCY RESPONSE EQUIPMENT BUILDING
535 West Jefferson
Springfield, Illinois
Floor Plan
ILLINOIS DEPARTMENT OF NUCLEAR SAFETY

Attachment E

EAST

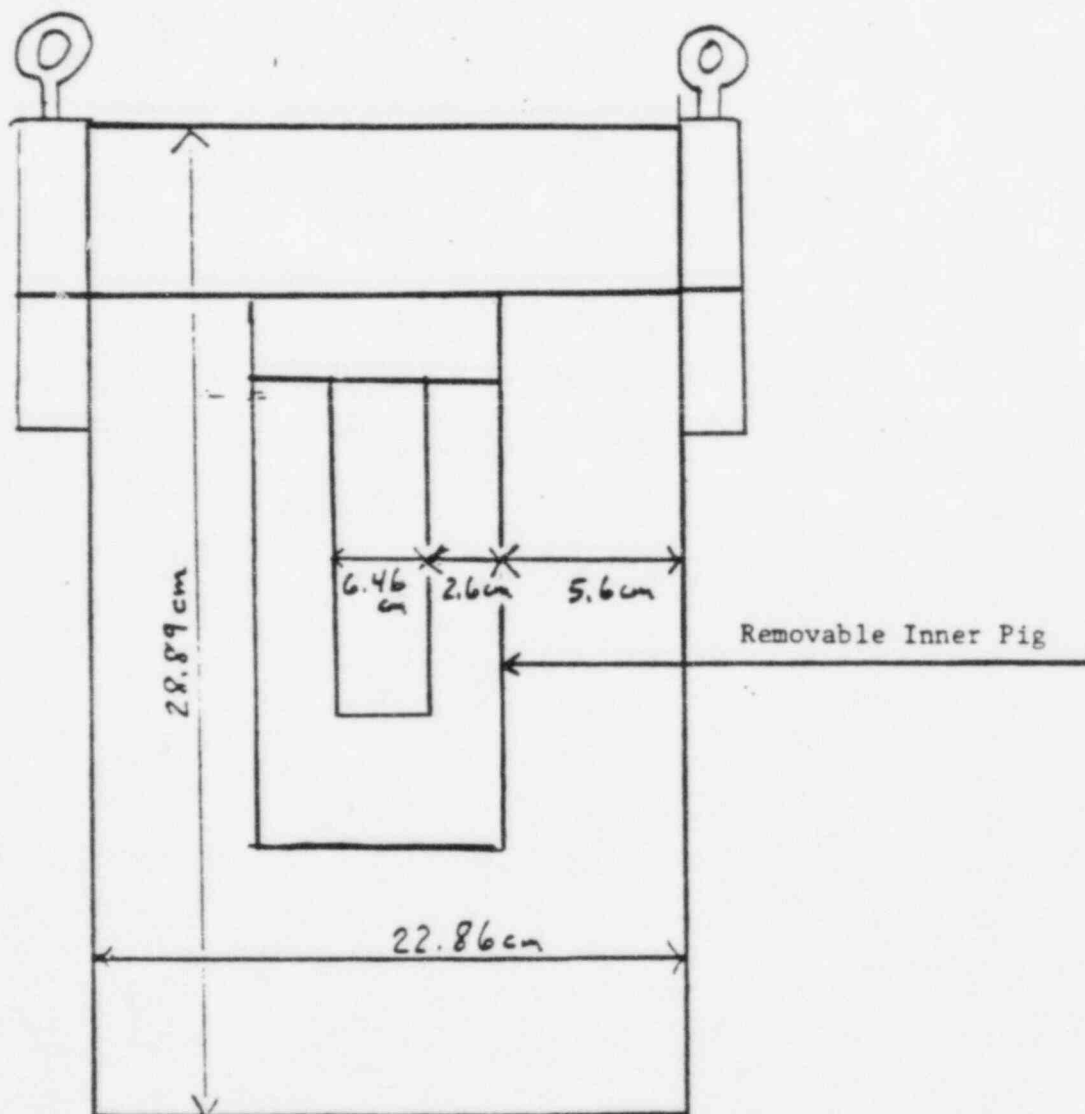


Keys given to staff personnel only.

ATTACHMENT E.

ILLINOIS DEPARTMENT OF NUCLEAR SAFETY

The sketch below is the type of transport container which may be used to transport or secure sources of radioactive material authorized in Item 5.A. of Attachment B.



Typical Transport Container

ATTACHMENT E

ILLINOIS DEPARTMENT OF NUCLEAR SAFETY

The following calculations were used to determine what amounts of Cobalt 60, Iridium 192, Radium 226, and Cesium 137 were necessary to produce radiation exposures of 1000 mR/hr and 5000 mR/hr respectively, at the outer surface of the transport container. Quantities of radioactive material different from those indicated, will be assessed using similar equations to determine the ability of the Department to secure the material. Personnel exposures will be limited by using distance, time, and shielding at the IDNS storage facility. Shielding calculations for the above container neglect the outer steel jacket.

EXAMPLE CALCULATION

Cobalt 60

$I = I_0 e^{-\mu x}$ from H.E.W. Radiological Health Handbook (RHHB)

1st approximation based upon 1000mCi

$$x^* = \frac{\Gamma A}{d^2}$$

Γ = gamma ray constant pg 131 RHHB
 A = activity of radionuclide millicuries
 d = distance - centimeters
 x^* = exposure rate R/hr

$$x^* = \frac{(13.2)(1000)}{(8.2)^2}$$

$$x^* = 196.312$$

$$\mu x = \ln \frac{I_0}{I} = 5.28 \quad \text{or}$$

$$\mu = \frac{0.693}{\text{half value layer}}$$

$$\mu = \frac{0.693}{1.2 \text{ cm} \leftarrow \text{from NCRP\#49 table 28}}$$

$$\mu = 0.578$$

B = Buildup factor taken from RHHB pg 147

$$B = 2.7$$

ATTACHMENT E

ILLINOIS DEPARTMENT OF NUCLEAR SAFETY

$$I = (196.312)(2.7)e^{-(0.578)(8.2)}$$

$$I = 4.634 \text{ R/hr}$$

100 R/hr reduces to 2.16 R/hr
50 R/hr reduces to 1.080 R/hr

$$x^* = \frac{\Gamma A}{d^2} \rightarrow A = \frac{x^* d^2}{\Gamma}$$

$$A = \frac{(50)(8.2)^2}{13.2}$$

A = 254.7mCi necessary to produce 1 R/hr field at surfaces of container side, therefore, an approximate maximum of 1273.5 millicuries of Cobalt 60 (5 R/hr) would be considered a safe quantity to secure in an emergency situation. A 100 Curie quantity of Cobalt 60 would create a 463.370 R/hr field at the surface of the container.

Radium 226

$$x^* = 122.695 \text{ R/hr based upon 1000 millicuries}$$

$$B = 2.5$$

$$\mu = 0.42$$

$$\mu x = (0.42)(8.2) = 3.44$$

$$I = (122.695)(2.2)e^{-3.44}$$

$$I = 8.655 \text{ R/hr}$$

$$75 \text{ R/hr reduces } 5.291 \text{ R/hr}$$

$$40 \text{ R/hr reduces } 2.822 \text{ R/hr}$$

$$18 \text{ R/hr reduces } 1.270 \text{ R/hr}$$

$$15 \text{ R/hr reduces } 1.058 \text{ R/hr}$$

$$\frac{(15)(8.2)^2}{8.25} = 22.255 \text{ millicuries} = 1\text{R/hr}$$

$$611.273 \text{ millicuries} = 5\text{R/hr}$$

ATTACHMENT E

ILLINOIS DEPARTMENT OF NUCLEAR SAFETY

Cesium 137

$$x' = 49.078 \text{ R/hr}$$

$$B = 2.1$$

$$\mu = 1.07 \text{ cm}^{-1} \quad \mu x = 8.774$$

$$I = (49.078)(2.1)e^{-8.774}$$

$$58.071 \text{ Curies} = 1 \text{ R/hr}$$

$$I = 0.016 \text{ R/hr}$$

$$290.355 \text{ Curies} = 5 \text{ R/hr}$$

Iridium 192

$$x' = 71.386 \text{ R/hr}$$

$$B = 3.3$$

$$\mu = 1.16 \text{ cm}^{-1}$$

$$\mu x = 0.280$$

$$I = (71.386)(3.3)e^{-0.280}$$

$$I = 0.022 \text{ R/hr}$$

$$56.033 \text{ Curies} = 1.231 \text{ R/hr}$$

The Department also possess an EPA type B container which has similar shielding characteristics as the container indicated above, except for the drum, padding and distance due to the drum. Several smaller lead pigs are also available.

ATTACHEMENT E

ILLINOIS DEPARTMENT OF NUCLEAR SAFETY

Illinois Department of Nuclear Safety Equipment

A. <u>Protective Equipment</u>	<u>Quantity</u>
1. Anti-C Coverall	14
2. Anti-C Hood	32
3. Anti-C Coverall (Plastic)	15
4. Cotton Glove Liners	8 doz.
5. Rubber Goves	8 doz.
6. Cotton Work Gloves	8 doz.
7. Plastic Shoe Covers (4 mil)	65 pr.
8. Rubber Boots	45 pr.
9. MSA Clearvue Full-Face Respirator (w/GMR Canister)	50 25
10. Self-Contained Breathing Apparatus (SCBA)	3
B. <u>Miscellaneous Support Equipment</u>	
1. Source Handling Tools	4

ATTACHMENT F
ILLINOIS DEPARTMENT OF NUCLEAR SAFETY

RADIATION PROTECTION PROGRAM

SURVEY PROGRAM

Surveys of radioactive materials will be conducted to assure compliance with 10CFR, Part 20. Surveys will be performed by the individual users and by the Radiation Safety Officer on a periodic basis.

Surveys of radioactive materials will include an evaluation and/or measurement of radiation levels for storage and use configurations.

Survey of radioactive materials will be performed to assure compliance with D.O.T. regulations prior to shipment.

Sufficient materials are available to handle any contamination problem. The department does not routinely handle unsealed radioactive materials necessitating a routine wipe survey program, therefore, wipe testing for contamination will be performed of work area based upon need.

Only trained personnel using calibrated instrumentation will perform surveys.

RECORDS MANAGEMENT PROGRAM

All records of surveys will be maintained and reviewed by the Radiation Safety Officer.

SEALED SOURCE LEAK TEST PROGRAM

All radioactive sealed sources, which are required to be leak tested, will be tested on a semi-annual basis.

All sources will be wipe tested by the individual user and/or the Radiation Safety Officer. Tweezers and/or tongs will be used if the radiation field requires such precaution. A leak test certificate will be maintained by the Radiation Safety Officer with a copy provided to each individual user.

ATTACHMENT F Cont'd

ILLINOIS DEPARTMENT OF NUCLEAR SAFETY

Mr. Carl Albright will perform analysis of test samples, using the analytical equipment indicated in Attachment D. A statement of Mr. Albright's education and experience is attached on Attachment G.

Mr. Albright participates in a Quality Assurance program sponsored by the USEPA, Environmental Monitoring System Laboratory, Los Vegas, Nevada. Results of the last cross check analysis indicated minimal detectable activity of $3.5 \times 10^{-5} \mu\text{Ci}$ for alpha radiation and $2.37 \times 10^{-5} \mu\text{Ci}$ for beta radiation. In addition, to participation in the E.M.S.L. quality assurance program, Mr. Albright maintains and routinely uses known standard for calibration of all analytical instrumentation.

See Attachment H for copies of Emergency Procedures and General Rules For the Safe Use of Radioactive Material.

ATTACHMENT G

ILLINOIS DEPARTMENT OF NUCLEAR SAFETY

Carl Albright, B.S., M.S.

Degrees - Chemistry
Western Illinois University
Macomb, Illinois

TRAINING AND EXPERIENCE OF EACH INDIVIDUAL NAMED IN ITEM 8 (Use supplemental sheets if necessary)

TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB (Circle answer)	FORMAL COURSE (Circle answer)
a. Principles and practices of radiation protection	United States Air Force	2 mos.	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input checked="" type="radio"/> Yes <input type="radio"/> No
b. Radioactivity measurement standardization and monitoring techniques and instruments	" " " "	3 mos.	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input checked="" type="radio"/> Yes <input type="radio"/> No
c. Mathematics and calculations basic to the use and measurement of radioactivity	" " " "	3 mos.	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input checked="" type="radio"/> Yes <input type="radio"/> No
d. Biological effects of radiation	" " " "		<input checked="" type="radio"/> Yes <input type="radio"/> No	<input checked="" type="radio"/> Yes <input type="radio"/> No

9. EXPERIENCE WITH RADIATION (Actual use of radioisotopes or equivalent experience)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
Atomic Nos. 3-83 plus trans Uranium elements	10 ³ Curies	U. S. Air Force State of Illinois Dept. of Public Health	23 yrs. 6 yrs.	Military Systems & Laboratory Analysis Environmental Bkg. & Monitoring studies

10. RADIATION DETECTION INSTRUMENTS (Use supplemental sheets if necessary)

TYPE OF INSTRUMENTS (Include make and model number of each)	NUMBER AVAILABLE	RADIATION DETECTED	SENSITIVITY RANGE (mr/hr)	WINDOW THICKNESS (mg/cm ²)	USE (Monitoring, surveying, measuring)

11. METHOD, FREQUENCY, AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED ABOVE.

12. FILM BADGES, DOSIMETERS, AND BIO-ASSAY PROCEDURES USED. (For film badges, specify method of calibrating and processing, or name of supplier.)

INFORMATION TO BE SUBMITTED ON ADDITIONAL SHEETS IN DUPLICATE

13. FACILITIES AND EQUIPMENT. Describe laboratory facilities and remote handling equipment, storage containers, shielding, fume hoods, etc. Explanatory sketch of facility is attached. (Circle answer) Yes No
14. RADIATION PROTECTION PROGRAM. Describe the radiation protection program including control measures. If application covers sealed sources, submit leak testing procedures where applicable, name, training, and experience of person to perform leak tests, and arrangements for performing initial radiation survey, servicing, maintenance and repair of the source.
15. WASTE DISPOSAL. If a commercial waste disposal service is employed, specify name of company. Otherwise, submit detailed description of methods which will be used for disposing of radioactive wastes and estimates of the type and amount of activity involved.

CERTIFICATE (This item must be completed by applicant)

16. THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATE ON BEHALF OF THE APPLICANT NAMED IN ITEM 1, 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.

License Fee Category: No Fee

Applicant named in item 1

Fee Enclosed \$ _____

By: _____

Date: _____

Title of certifying official

ATTACHMENT # 1
ILLINOIS DEPARTMENT OF NUCLEAR SAFETY
GENERAL RULES FOR THE SAFE USE OF

RADIOACTIVE MATERIAL

1. Wear laboratory coats or other protective clothing at all times in areas where radioactive materials are used.
2. Wear disposable gloves at all times while handling radioactive materials.
3. Monitor hands and clothing for contamination after each procedure or before leaving the area.
4. Use syringe shields for preparation of patient doses and administration to patients except in circumstances such as pediatric cases when their use would compromise the patient's well-being.
5. Do not eat, drink, smoke or apply cosmetics in any area where radioactive material is stored or used.
- * 6. Assay each patient dose in the dose calibrator prior to administration. Do not use any doses that differ from the prescribed dose by more than 10%.
7. Maintain accurate records with regard to the receipt, transfer, and disposal of radioactive material, surveys, and personnel exposures.
8. All areas where radionuclides are stored are to be secured at all times when unattended.
9. Wear personnel monitoring devices (film badge or TLD) at all times while in areas where radioactive materials are used or stored. These should be worn at chest or waist level.
- * 10. Wear TLD finger badges during elution of generator and preparation, assay, and injection of radiopharmaceuticals.
11. Dispose of radioactive waste only in specially designated receptacles.

12. Never pipette by mouth.
- * 13. Survey generator, kit preparation, and injection areas for contamination after each procedure or at the end of the day. Decontaminate if necessary.
14. Confine radioactive solutions in covered containers plainly identified and labeled with name of compound, radionuclide, date, activity, and radiation level if applicable.
15. Always transport radioactive material in shielded containers.

RADIATION SAFETY OFFICER: George M. McCann

OFFICE PHONE: 217/546-8100

HOME PHONE: 217/636-8996

ALTERNATE:

Maury Neuweg

Office Phone: 217/546-8100
Home Phone: []

Gary Wright

Office Phone: 217/546-8100
Home Phone: []

ATTACHMENT #4:
ILLINOIS DEPARTMENT OF NUCLEAR SAFETY
EMERGENCY PROCEDURES

Minor Spills

1. NOTIFY: Notify persons in the area that a spill has occurred.
2. PREVENT THE SPREAD: Cover the spill with absorbent paper.
3. CLEAN UP: Use disposable gloves and remote handling tongs. Carefully fold the absorbent paper and pad. Insert into a plastic bag and dispose of in the radioactive waste container. Also insert into the plastic bag all other contaminated materials such as disposable gloves.
4. SURVEY: With a low range, thin window G-M survey meter, check the area around the spill, hands, and clothing for contamination.
5. REPORT: Report incident to the Radiation Safety Officer.

Major Spills:

1. CLEAR THE AREA: Notify all persons not involved in the spill to vacate the room.
2. PREVENT THE SPREAD: Cover the spill with absorbent pads, but do not attempt to clean it up. Confine the movement of all personnel potentially contaminated to prevent the spread.
3. SHIELD THE SOURCE: If possible, the spill should be shielded, but only if it can be done without further contamination or without significantly increasing your radiation exposure.
4. CLOSE THE ROOM: Leave the room and lock the door(s) to prevent entry.
5. CALL FOR HELP: Notify the Radiation Safety Officer immediately.
6. PERSONNEL DECONTAMINATION: Contaminated clothing should be removed and stored for further evaluation by the Radiation Safety Officer. If the spill is on the skin, flush

thoroughly and then wash with mild soap and lukewarm water.

RADIATION SAFETY OFFICER: George M. McCann

OFFICE PHONE: 217/546-8100

HOME PHONE: []

ALTERNATE NAMES AND TELEPHONE NUMBERS DESIGNATED BY RSO:

Maury Neuweg Office Phone: 217/546-8100

Home Phone: []

Gary Wright Office Phone: 217/546-8100

Home Phone: []

SEALED SOURCES:

LOSS, THEFT, OR DAMAGE TO A SEALED SOURCE OF RADIOACTIVE MATERIAL

In addition to following the applicable procedures outlined above, notify the Radiation Safety Officer and the Illinois Department of Nuclear Safety - 217-546-8100 or 217-782-7860.

ATTACHMENT I

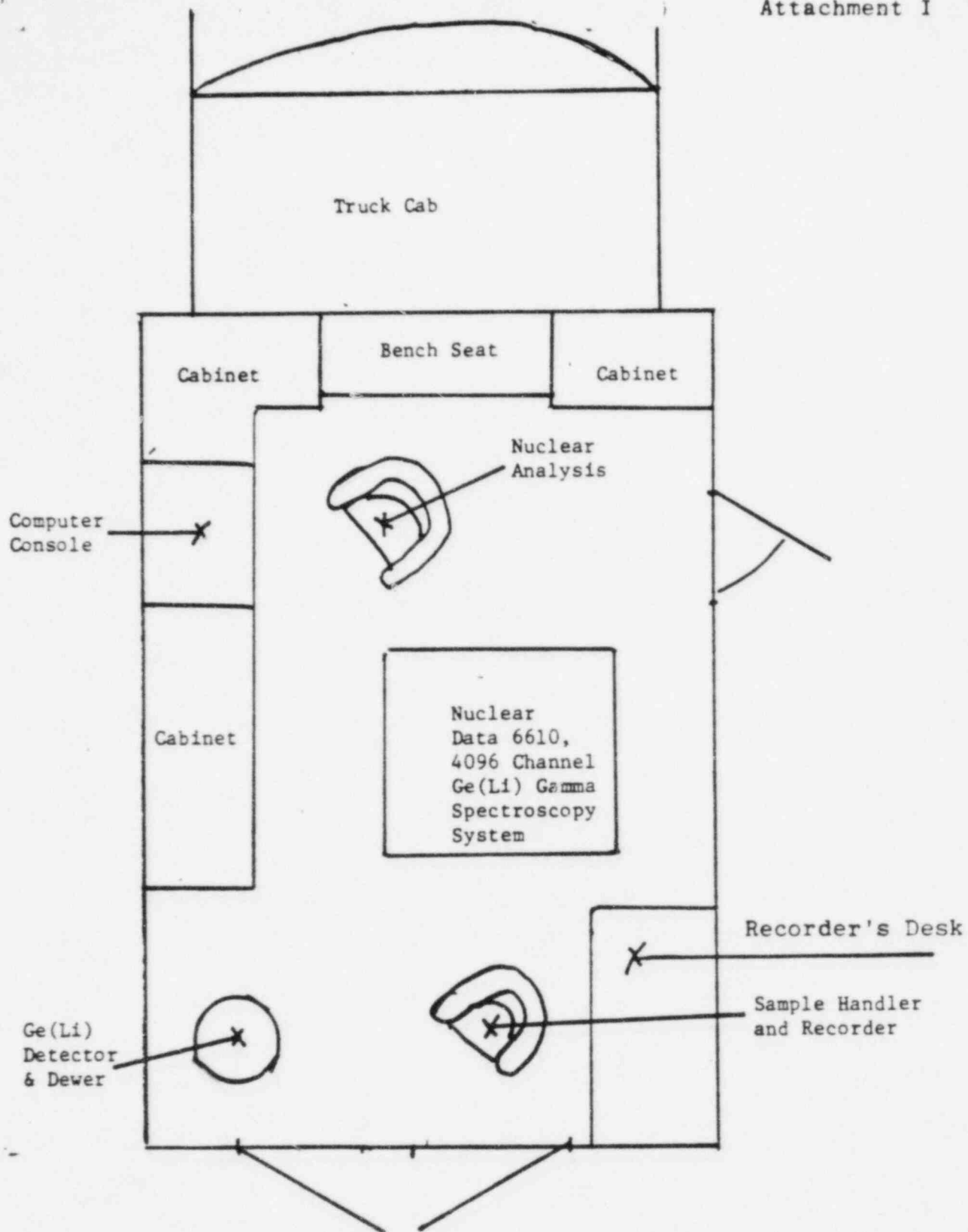
ILLINOIS DEPARTMENT OF NUCLEAR SAFETY

The IDNS mobile laboratory serves as a gamma analysis system at various temporary job sites throughout the State of Illinois. Only containerized environmental samples are brought into lab. No radiochemicals are prepared or processed in the lab.

Samples brought from field sampling teams are surveyed and wiped for removable gross contamination prior to be taken into the mobile lab. A gross wipe of the sample containers are checked using an Eberline count rate meter with a Model HP-260 pancake probe.

The mobile laboratory will be surveyed prior to being moved from its sampling site.

General laboratory hygiene rules will be followed, e.g. no food, smoking, etc.



ILLINOIS DEPARTMENT OF NUCLEAR SAFETY
MOBILE LABORATORY