

Monsanto

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April 19, 1985

United States Nuclear Regulatory Commission Region VII
Material Licensing Section
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Attention: Dr. W. J. Adam

Control #78407
License #24-01113-02

Gentlemen:

After our phone conversation of April 15, 1985, on the definition of "Users", I would like our amended license to read in Section 12 of the supplementary sheet; those persons authorized by the Radiation Protection Officer shall use or directly supervise the use of licensed material under the supervision of the Radiation Protection Officer or the Alternate Radiation Protection Officer. This would be a more practical approach as discussed with Dr. Adam, since departments using the nuclear gauges at our facility are periodically changing supervision and under the present system every supervisory change constitutes a Licensing Amendment. The training and duties of the Radiation Protection Officer and the Alternate Radiation Protection Officer are already on file. An outline of the training given to those persons defined as "Users" is attached.

Hopefully this letter will answer any questions regarding your amending of our nuclear license that we applied for in February of this year.

Yours very truly,

A. T. Kavlick

A. T. Kavlick, CIHT
Radiation Protection Officer

RECEIVED
APR 29 1985
REGION III

ATK:cs
Attach.

APR 29 1985

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OUTLINE FOR THE TRAINING OF "USERS" AT J. F. QUEENY PLANT

I. FAMILIARIZATION WITH PROCEDURE #749

- A. What is a "User"?
- B. What are a "User's" responsibilities?
- C. Who is the Radiation Protection Officer and the Alternate Radiation Protection Officer?
- D. Questions and Answers Session

II. HOW WE GET A NUCLEAR LICENSE

- A. Review packet of information.
- B. Questions and Answers Session

III. FAMILIARIZATION WITH THE TYPES OF NUCLEAR GAUGES IN THE PLANT

- A. Density Gauges - Manufacturers, Types
- B. Level Gauges - Manufacturers, Types

IV. FIELD TRIP TO DEPARTMENTS THAT HAVE NUCLEAR GAUGES

- A. Where are they?
- B. Proper Posting of the Area
- C. Questions and Answers Session

Developed by: A. T. Kavlick
Radiation Protection Officer

Revised: January 1985

PROCUREMENT AND HANDLING OF RADIOACTIVE MATERIALS AND X-RAY PRODUCING EQUIPMENT

CONFIDENTIAL

I. PURPOSE

The purpose of this procedure is to outline the formal procedures necessary for procurement and handling of radioactive materials and x-ray producing equipment in the J. F. Queeny Plant, including our obligations under our radioactive material license issued by the U. S. Nuclear Regulatory Commission.

II. SCOPE

The procedure covers procurement, storage, use, monitoring, disposal, records, and responsibilities connected with radioactive materials and x-ray producing equipment at the J. F. Queeny Plant.

"Radioactive Materials" are defined as elements or isotopes, whether free or combined, which spontaneously emit particles and/or rays by the disintegration of the nuclei of their atoms. "X-ray producing equipment" includes a variety of equipment capable of producing radiations of the same nature as light radiation, but of extremely short wavelengths (10^{-7} to 10^{-9} cm.).

III. RESPONSIBILITIES

The Radiation Safety Officer (RSO) is basically responsible for the safe handling of radioactive materials and x-ray producing equipment at the J. F. Queeny Plant. This shall include approval for procurement, storage, use, monitoring, and disposal, maintaining of necessary records, licenses, and payment of fees.

The "Users" are responsible for ordering, providing maintenance of, and supervising the use of radioactive materials and x-ray producing equipment.

In keeping with the U.S.N.R.C. regulations, the RSO is specifically named in the license. Also, the "Users" who directly supervise the use and maintenance of radioactive materials or devices, are specifically named in the license on file with the U.S.N.R.C.

At present they are:

Radiation Safety Officer	-	A. T. Kavlick, I. H. Technician
Alternate Radiation Safety Officer	-	A. J. Politte, I. H. Technician
"Users"		

R. P. Yenzer, Supervisor Phosphate Esters Department 50
M. D. Moseley, Supervisor Maleic Dept.
F. A. Krewet, M.D., Medical Department

Persons engaged in the actual handling or use of radioactive materials or x-ray producing equipment are responsible for knowledge of the safety requirements and legal regulations applicable to their particular use, and for meeting the safety requirements when such materials or equipment are in their custody.

Persons supervising contractors handling radioactive materials or x-ray producing equipment have the same responsibility as persons actually handling the materials or equipment themselves. This includes approval and use of radioactive equipment by contractors or other groups for detection of defects in metal tanks, bearings, housings and similar equipment.

PROCUREMENT AND HANDLING OF RADIOACTIVE MATERIALS AND X-RAY PRODUCING EQUIPMENTF. Records

The following records are required and shall be maintained by the RSO:

1. Copies of purchase orders and receipts of all radioactive materials and x-ray equipment.
2. Annual total of each radioactive material in the plant.
3. Disposal records.
4. Radiation profile on each fixed device utilizing a sealed source and x-ray producing machine taken immediately after installation.
5. Location of radioactive materials and x-ray equipment.
6. Film badge records.
7. Monitoring surveys.
8. Wipe-test records of all sealed sources.
9. Monitoring surveys of x-ray equipment.
10. Investigation reports of radioactive spills or excess personnel exposure to radiation.

Updated by:

A. T. Kavlick
A. T. Kavlick

Approved by:

J. F. Knollmeyer
Plant Manager

PROCUREMENT AND HANDLING OF RADIOACTIVE MATERIALS AND X-RAY PRODUCING EQUIPMENTC. Handling and Use (Cont.)

7. For x-ray equipment installed in the plant, the written operating plans, the completed physical installation, written operating and repair instructions including adequate safety precautions, and any modification to the installation shall be approved by the RSO.
8. Contract radiographers working in the plant are required to follow all regulations for Radiation Control.
9. The Monsanto supervisor responsible for the contract work, with the advice of the RSO, will assure that the contractor is knowledgeable of safety precautions and safety regulations, and that they are being followed. The Monsanto supervisor will notify the RSO, in advance of the contractor's arrival, as to:
 - a. Name of contractor.
 - b. Location and type of work planned.
 - c. Day and time work will be done.
10. The RSO will keep members of the Safety Department up-to-date on the location of radioactive materials in the plant.
11. If radioactive materials are involved in a fire or explosion, the area will require immediate radioactivity monitoring after the emergency is under control. No person will be permitted in the immediate area until a survey can be made by the RSO or the Alternate RSO.

D. Radiation Monitoring

1. Film badges shall be worn when necessary by personnel while engaged in the actual handling or use of radioactive materials or x-ray equipment. These badges are issued to individuals by the RSO as needed and are not transferable.
2. In general, areas using unsealed radioactive materials shall be surveyed as necessary by the individual using the radioisotope. All such areas will be monitored monthly by the RSO or his alternate.
3. All fixed devices using sealed sources and all x-ray producing equipment shall be surveyed for radiation profile, upon installation, by the RSO, and shall be monitored semi-annually thereafter by the RSO or his alternate.
4. All sealed sources shall be "wipe-tested" at one year intervals by the RSO or at frequencies set forth by the U.S.N.R.C.

E. Disposal

No waste disposal may be made until a copy of the Radioactive Waste Disposal Request form has been filled out and approved by the RSO (See Appendix A).

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PROCUREMENT AND HANDLING OF RADIOACTIVE MATERIALS AND X-RAY PRODUCING EQUIPMENTIV. PROCEDUREA. Procurement

1. By law, only the Licensee (J.F.Q. Industrial Hygiene Dept.) may request purchase of radioactive materials. Such materials to be used at the J. F. Queeny Plant will be obtained from the Licensee through the RSO.
2. Before radioactive materials are brought to the plant, the persons who will actually handle them shall discuss their handling, storage, physical installation (of fixed devices), monitoring, disposal, and all other safety precautions to be observed with the RSO, and get his agreement. The arrangements shall then be summarized in a written memorandum to the RSO for file.
3. Since x-ray producing equipment must be registered, it shall also be procured through the RSO.

B. Storage

1. The RSO will assure that radioactive materials not in use are stored in properly labeled and shielded containers secured against unauthorized access or removal. Background radiation level in unrestricted areas shall be less than 2 mr/hr.
2. Sealed sources shall be shielded to reduce the radiation level to a maximum of 5 mr/hr. at the surface of the shield and no more than 1 mr/hr. at 36 inches.
3. All areas wherein radioactive materials are stored shall be conspicuously posted with approved radiation warning signs, as required by law.

C. Handling and Use

1. When radioactive materials are withdrawn from storage for actual use, the RSO will log the name of the person responsible for their handling when in actual use, and the proximate location of use.
2. The person actually using the materials will maintain physical custody of them until return to storage or see that they are temporarily stored adequately to prevent inadvertent exposure or unauthorized access, will conform to the agree-on plan of handling, monitoring, disposal, and safety precautions, and will assure that other individuals are not exposed to hazardous radiation. He will return the materials to storage as soon as practical.
3. The RSO will log the return of materials to storage.
4. Sealed sources used in fixed devices shall be installed, placed in operation, or removed only with the approval of the RSO.
5. Vessels utilizing radioactive sealed sources shall not be entered until the source holder has been locked in the shielded position. Radiation monitoring will be performed before tank entry in addition to standard Plant Tank Entry Procedures.
6. No sealed source shall be repaired or altered without the approval of the RSO.

PROCUREMENT AND HANDLING OF RADIOACTIVE MATERIALS AND X-RAY PRODUCING EQUIPMENTRADIOACTIVE WASTE DISPOSAL REQUEST

Date _____ Location of Waste _____

Approximate Volume
and Composition _____Curie Activity of Each
Radioactive Element _____

External Radiation _____

Container to be Saved
or Destroyed _____

Disposal Requested By _____

FINAL DISPOSALReason For Disposal
or Removal _____

Place of Disposal _____

Method of Disposal _____

Disposed By _____

Date _____ Radiation Safety Officer _____

~~COMPANY~~
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DISTRIBUTION:

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Updated - January, 1980

PAGE 1 OF 1

NUCLEAR TERMS

Excerpts from

"Nuclear Terms, a Brief Glossary"

absorbed dose

When IONIZING RADIATION passes through MATTER some of its energy is imparted to the matter. The amount absorbed per unit mass of irradiated material is called the absorbed dose, and is measured in rems and rads.

absorber

Any material that absorbs or diminishes the intensity of ionizing RADIATION. Neutron absorbers, like boron, hafnium, and cadmium, are used in control rods for reactors. Concrete and steel absorb gamma rays and neutrons in reactor shields. A thin sheet of paper or metal will absorb or attenuate alpha particles and all except the most energetic beta particles.

alpha particle

(Symbol α (alpha)) A positively charged particle emitted by certain radioactive materials. It is made up of two neutrons and two protons bound together, hence is identical with the nucleus of a helium atom. It is the least penetrating of the three common types of radiation (alpha, beta, gamma) emitted by radioactive material, being stopped by a sheet of paper. It is not dangerous to plants, animals or man unless the alpha-emitting substance has entered the body.

atom

A particle of matter indivisible by chemical means. It is the fundamental building block of the chemical elements. The elements, such as iron, lead, and sulfur, differ from each other because they contain different kinds of atoms. There are about six sextillion (6 followed by 21 zeros, or 6×10^{21}) atoms in an ordinary drop of water. According to present-day theory, an atom contains a dense inner core (the nucleus) and a much less dense outer domain consisting of electrons in motion around the nucleus. Atoms are electrically neutral.

atomic mass unit

(Symbol amu) One-twelfth the mass of a neutral atom of the most abundant isotope of carbon, C-12.

atomic number -

(Symbol Z) The number of protons in the nucleus of an atom, and also its positive charge. Each chemical element has its characteristic atomic number, and the atomic numbers of the known elements form a complete series from 1 (hydrogen) to 103 (lawrencium).

atomic weight

The mass of an atom relative to other atoms. The present-day basis of the scale of atomic weights is carbon; the commonest isotope of this element has arbitrarily been assigned an atomic weight of 12. The unit of the scale is $1/12$ the weight of the carbon-12 atom, or roughly the mass of one proton or one neutron. The atomic weight of any element is approximately equal to the total number of protons and neutrons in its nucleus.

background radiation

The radiation in man's natural environment, including cosmic rays and radiation from the naturally radioactive elements, both outside and inside the bodies of men and animals. It is also called natural radiation. The term may also mean radiation that is unrelated to a specific experiment.

beta particle

(Symbol β (beta)) An elementary particle emitted from a nucleus during radioactive decay, with a single electrical charge and a mass equal to $1/1837$ that of a proton. A negatively charged beta particle is identical to an electron. A positively charged beta particle is called a positron. Beta radiation may cause skin burns, and beta-emitters are harmful if they enter the body. Beta particles are easily stopped by a thin sheet of metal, however.

biological half-life	The time required for a biological system, such as a man or an animal, to eliminate, by natural processes, half the amount of a substance (such as a radioactive material) that has entered it.
biological shield	A mass of absorbing material placed around a reactor or radioactive source to reduce the radiation to a level that is safe for human beings.
charged particle	An ion; an elementary particle that carries a positive or negative electric charge.
collimator	A device for focusing or confining a beam of particles or radiation, such as X rays.
curie	(Symbol Ci) The basic unit to describe the intensity of radioactivity in a sample of material. The curie is equal to 37 billion disintegrations per second, which is approximately the rate of decay of 1 gram of radium. A curie is also a quantity of any nuclide having 1 curie of radioactivity. Named for Marie and Pierre Curie, who discovered radium in 1898.
detector	Material or a device that is sensitive to radiation and can produce a response signal suitable for measurement or analysis. A radiation detection instrument.
dose equivalent	A term used to express the amount of effective radiation when modifying factors have been considered. The product of absorbed dose multiplied by a quality factor multiplied by a distribution factor. It is expressed numerically in rems.
dose rate	The radiation dose delivered per unit time and measured, for instance, in rems per hour.
dosimeter	A device that measures radiation dose, such as a film badge or ionization chamber.
electromagnetic radiation	Radiation consisting of associated and interacting electric and magnetic waves that travel at the speed of light. Examples: light, radio waves, gamma rays, X rays. All can be transmitted through a vacuum.

electron	(Symbol e^-) An elementary particle with a unit negative electrical charge and a mass $1/1837$ that of the proton. Electrons surround the positively charged nucleus and determine the chemical properties of the atom. Positive electrons, or positrons, also exist.
element	One of the 103 known chemical substances that cannot be divided into simpler substances by chemical means. A substance whose atoms all have the same atomic number. Examples: hydrogen, lead, uranium. (Not to be confused with fuel element.)
elementary particles	The simplest particles of matter and radiation. Most are short-lived and do not exist under normal conditions (exceptions are electrons, neutrons, protons and neutrinos). Originally this term was applied to any particle that could not be subdivided, or to constituents of atoms; now it is applied to nucleons (protons and neutrons), electrons, mesons, muons, baryons, strange particles, and the antiparticles of each of these, and to photons, but not to alpha particles or deuterons. Also called fundamental particles.
film badge	A light-tight package of photographic film worn like a badge by workers in nuclear industry or research, used to measure possible exposure to IONIZING RADIATION. The absorbed dose can be calculated by the degree of film darkening caused by the irradiation.
flux (neutron)	A measure of the intensity of neutron radiation. It is the number of neutrons passing through 1 square centimeter of a given target in 1 second. Expressed as nv , where n = the number of neutrons per cubic centimeter and v = their velocity in centimeters per second.
gamma rays	(Symbol γ (gamma)) High-energy, short wavelength electromagnetic radiation. Gamma radiation frequently accompanies alpha and beta emissions and always accompanies fission. Gamma rays are very

penetrating and are best stopped or shielded against by dense materials, such as lead or depleted uranium. Gamma rays are essentially similar to X-rays, but are usually more energetic, and are nuclear in origin.

gauging

The measurement of the thickness, density or quantity of material by the amount of radiation it absorbs. This is the most common use of radioactive isotopes in industry. Also spelled gaging.

half-life

The time in which half the atoms of a particular radioactive substance disintegrate to another nuclear form. Measured half-lives vary from millionths of a second to billions of years.

health physics

Health Physics is a profession devoted to the protection of man and his environment from unwarranted radiation exposure. The health physicist is a person engaged in the study of problems and practices of providing radiation protection; he is concerned with an understanding of the mechanisms of radiation damage, with the development and implementation of methods and procedures necessary to evaluate radiation hazards and with providing protection to man and his environment from unwarranted exposure.

induced radioactivity

Radioactivity that is created when substances are bombarded with neutrons, as from a nuclear explosion or in a reactor, or with charged particles produced by accelerators.

ion

An atom or molecule that has lost or gained one or more ELECTRONS. By this IONIZATION it becomes electrically charged. Examples: an alpha particle, which is a helium atom minus two electrons; a proton, which is a hydrogen atom minus its electron.

ionization

The process of adding one or more ELECTRONS to, or removing one or more electrons from, atoms or molecules, thereby creating IONS. High temperatures, electrical discharges, or nuclear radiations can cause ionization.

ionizing radiation	Any radiation displacing electrons from atoms or molecules, thereby producing IONS. Examples: alpha, beta, gamma radiation, short-wave ultraviolet light. Ionizing radiation may produce severe skin or tissue damage.
isotope	One of two or more atoms with the same ATOMIC NUMBER (the same chemical element) but with different ATOMIC WEIGHTS. An equivalent statement is that the nuclei of isotopes have the same number of protons but different numbers of neutrons. Thus, ^{12}C , ^{13}C , and ^{14}C are isotopes of the element carbon, the symbols denoting their common ATOMIC NUMBERS, the superscripts denoting the differing MASS NUMBERS, or approximate atomic weights. Isotopes usually have very nearly the same chemical properties, but somewhat different physical properties.
mass number	(Symbol A) The sum of the neutrons and protons in a NUCLEUS. It is the nearest whole number to an atom's ATOMIC WEIGHT. For instance, the mass number of uranium-235 is 235.
Mev	One million (or 10^6) electron volts. (Also written as MeV.)
micro	A prefix that divides a basic unit by one million.
milli	A prefix that divides a basic unit by one thousand.
molecule	A group of atoms held together by chemical forces. The atoms in the molecule may be identical, as in H_2 , S_2 , and S_8 , or different, as in H_2O and CO_2 . A molecule is the smallest unit of matter which can exist by itself and retain all its chemical properties.
neutron	(Symbol n) An uncharged ELEMENTARY PARTICLE with a mass slightly greater than that of the PROTON, and found in the NUCLEUS of every atom heavier than hydrogen. A free neutron is unstable and decays with a half-life of about 13 minutes into an electron, proton, and neutrino. Neutrons sustain the fission CHAIN REACTION in a NUCLEAR REACTOR.

neutron capture	The process in which an atomic NUCLEUS absorbs or captures a neutron. The probability that a given material will capture neutrons is measured by its neutron capture CROSS SECTION, which depends on the energy of the neutrons and on the nature of the material.
nuclear reactor	A device in which a fission CHAIN REACTION can be initiated, maintained, and controlled. Its essential component is a CORE with fissionable FUEL. It usually has a MODERATOR, a REFLECTOR, SHIELDING, COOLANT, and control mechanisms. Sometimes called an atomic "furnace", it is the basic machine of NUCLEAR ENERGY.
nucleus	The small, positively charged core of an ATOM. It is only about 1/10,000 the diameter of the atom but contains nearly all the atom's mass. All nuclei contain both PROTONS and NEUTRONS, except the nucleus of ordinary hydrogen, which consists of a single proton.
particle	A minute constituent of MATTER, generally one with a measurable mass. The primary particles involved in radioactivity are ALPHA PARTICLES, BETA PARTICLES, NEUTRONS, and PROTONS.
proton	An ELEMENTARY PARTICLE with a single positive electrical charge and a mass approximately 1837 times that of the ELECTRON. The nucleus of an ordinary or light hydrogen ATOM. Protons are constituents of all nuclei. The ATOMIC NUMBER (Z) of an atom is equal to the number of protons in its NUCLEUS.
quality factor	The factor by which absorbed dose is to be multiplied to obtain a quantity that expresses on a common scale, for all ionizing radiations, the irradiation incurred by exposed persons.
rad	(Acronym for Radiation Absorbed Dose.) The basic unit of absorbed dose of IONIZING RADIATION. A dose of one rad means the absorption of 100 ergs of radiation energy per gram of absorbing material.
radiation	The emission and propagation of ENERGY through matter or space by means of electromagnetic disturbances which display both wave-like and particle-like behavior; in this context the "particles" are known as PHOTONS. Also, the energy so propagated. The term has been extended to include streams of fast-moving PARTICLES (alpha and beta particles, free neutrons, cosmic radiation,

etc.). Nuclear radiation is that emitted from atomic nuclei in various NUCLEAR REACTIONS, including alpha, beta and gamma radiation and neutrons.

radiation protection
guide

The officially determined radiation doses which should not be exceeded without careful consideration of the reasons for doing so. These standards, established by the Federal Radiation Council, are equivalent to what was formerly called the MAXIMUM PERMISSIBLE DOSE or MAXIMUM PERMISSIBLE EXPOSURE.

radiation source

Usually a man-made, sealed source of RADIO-ACTIVITY used in teletherapy, radiography, as a power source for batteries, or in various types of industrial gauges. Machines such as accelerators, and radioisotopic generators and natural radionuclides may also be considered as sources.

radiation standards

Exposure standards, permissible concentrations, rules for safe handling, regulations for transportation, regulations for industrial control of radiation, and control of radiation exposure by legislative means.

radioisotope

A radioactive isotope. An unstable isotope of an element that decays or disintegrates spontaneously, emitting radiation. More than 1300 natural and artificial radioisotopes have been identified.

rem

(Acronym for Roentgen Equivalent Man.) The unit of dose of any ionizing radiation which produces the same biological effect as a unit of ABSORBED DOSE of X rays. The equivalent dose (in REMS) = QF x absorbed dose (in RADS).

roentgen

(Abbreviation R) A unit of exposure to IONIZING RADIATION. It is that amount of gamma or X rays required to produce ions carrying 1 electrostatic unit of electrical charge (either positive or negative) in 1 cubic centimeter of dry air under standard conditions. Named after Wilhelm Roentgen, German scientist who discovered X rays in 1895.

scattering

A process that changes a particle's trajectory. Scattering is caused by PARTICLE collisions

with atoms, nuclei, and other particles or by interactions with fields of magnetic force. If the scattered particle's internal energy (as contrasted with its kinetic energy) is unchanged by the collision, elastic scattering prevails; if there is a change in the internal energy, the process is called inelastic scattering.

shield(shielding)

A body of material used to reduce the passage of radiation.

X ray

A penetrating form of electromagnetic radiation emitted either when the inner orbital electrons of an excited atom return to their normal state (these are characteristic X rays), or when a metal target is bombarded with high speed electrons (these are bremsstrahlung). X rays are always nonnuclear in origin.



HOW TO GET A LICENSE

**to
use**

RADIOISOTOPES

U.S. NUCLEAR REGULATORY COMMISSION

INSTRUCTIONS FOR PREPARATION OF
APPLICATION FOR BYPRODUCT MATERIAL LICENSE

FORM NRC-313 (II)

CUSTOMER ASSISTANCE SAMPLE (B)

NOTE: Shows typical examples combined for DensART, LevelART, WeighART & WebART

OHMART FURNISHES

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.
J (1)	Source Holder	Ohmart	SR-1
K (2)	Source Holder	Ohmart	SHRM
L (3)	Source Holder	Ohmart	SHLM
M (4)	Source Holder	Ohmart	BG-12

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)	NONE REQUIRED BY THE USER. THE OHMART CORPORATION WILL PROVIDE A FIELD SERVICE REPRESENTATIVE TO DO INITIAL AND ON-GOING TESTS REQUIRED, USING PROPER INSTRUMENTATION.					
(2)						
(3)						
(4)						

11. CALIBRATION OF INSTRUMENTS LISTED IN ITEM 10

☐ a. CALIBRATED BY SERVICE COMPANY

NAME, ADDRESS, AND FREQUENCY

Not Applicable

☐ b. CALIBRATED BY APPLICANT

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

Not Applicable

12. PERSONNEL MONITORING DEVICES

TYPE (Check and/or complete as appropriate.) A.	SUPPLIER (Service Company) B.	EXCHANGE FREQUENCY C.
<input type="checkbox"/> (1) FILM BADGE <input type="checkbox"/> (2) THERMOLUMINESCENCE DOSIMETER (TLD) <input type="checkbox"/> (3) OTHER (Specify): NOT APPLICABLE	NONE REQUIRED BY USER. RADIATION DOES NOT EXCEED 5 MR/HR AT ONE (1) FOOT FROM GAGE OUTLINE AND 100 MR/HR FIELD IS NOT PRESENT	<input type="checkbox"/> MONTHLY <input type="checkbox"/> QUARTERLY <input type="checkbox"/> OTHER (Specify): NOT APPLICABLE

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.

Not Applicable

14. WASTE DISPOSAL

- a. NAME OF COMMERCIAL WASTE DISPOSAL SERVICE EMPLOYED Complete as shown on
 Attached Byproduct Material License Attachment (Form SDFV5479)
 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.
 Complete as shown on
 Attached Byproduct Material License Attachment (Form SDFV5479)

CUSTOMER ASSISTANCE SAMPLE (A)

NOTE; Shows typical examples combined for DensART, LevelART, WeighART & WebART

CUSTOMER COMPLETES

FORM NRC-313 I (6-78) 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				<input checked="" type="radio"/> A a. NEW LICENSE	
See attached instructions for details.				<input type="radio"/> B b. AMENDMENT TO: LICENSE NUMBER	
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.				<input type="radio"/> C c. RENEWAL OF: LICENSE NUMBER	
2. APPLICANT'S NAME <i>(Institution, firm, person, etc.)</i> <input checked="" type="radio"/> D ACE CHEMICAL COMPANY			3. NAME OF PERSON TO BE CONTACTED REGARDING THIS APPLICATION <input checked="" type="radio"/> E ELMO R. SMEDLEY		
TELEPHONE NUMBER: AREA CODE - NUMBER EXTENSION 1-614-555-1212			TELEPHONE NUMBER: AREA CODE - NUMBER EXTENSION 1-614-555-1212		
4. APPLICANT'S MAILING ADDRESS <i>(Include Zip Code)</i> <input checked="" type="radio"/> F P. O. Box 965 Anytown, Ohio 43000			5. STREET ADDRESS WHERE LICENSED MATERIAL WILL BE USED <i>(Include Zip Code)</i> <input checked="" type="radio"/> G 123 Main Street Anytown, Ohio 43000		
(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. Joe M. Doakes			Plant Supervisor		
b. Donald Smith			Maintenance Supervisor		
c. Susan B. Anthony			Instrument Supervisor		
7. RADIATION PROTECTION OFFICER Elmo R. Smedley			Attach a resume of person's training and experience as outlined in Items 16 and 17 and describe his responsibilities under Item 15. List Any Training or Experience		

8. LICENSED MATERIAL

OHMART FURNISHES

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 ACTIVITY PER SOURCE WHICH WILL BE POSSESSED AT ANY ONE TIME D
<input checked="" type="radio"/> J (1)	Cs-137	Sealed Source	Ohmart A2102	50 mCi
<input checked="" type="radio"/> K (2)	Cs-137	Sealed Source	Ohmart A5771	35 mCi
<input checked="" type="radio"/> L (3)	CO-60	Sealed Source	Ohmart 17-2100	2000 mCi
<input checked="" type="radio"/> M (4)	AM-241	Sealed Source	Ohmart A5799	1000 mCi
DESCRIBE USE OF LICENSED MATERIAL E				
<input checked="" type="radio"/> J (1)	Used in an ED-6 to measure density in a pipe.			
<input checked="" type="radio"/> K (2)	Used in a BW-36 to weigh material on a belt.			
<input checked="" type="radio"/> L (3)	Used in a SHLM to measure level in a vessel.			
<input checked="" type="radio"/> M (4)	Used in a BG-12 to measure weight/unit area.			

ASSISTANCE DIRECTIONS: Use only item ☒ **J** for Density gage license
 Use only item ☒ **K** for Weigh Scale license
 Use only item ☒ **L** for Level gage license
 Use only item ☒ **M** for Thickness and/or Basis Weight gage license

CUSTOMER ASSISTANCE SAMP
 BASED ON ASSUMPTION THAT
 CUSTOMER WILL USE OHMART
 FIELD SERVICE



LICENSE ATTACHMENT SAMPLE

U. S. NUCLEAR REGULATORY COMMISSION

ITEM 14. WASTE DISPOSAL

Whenever the source holder is no longer needed it will be either

1. Removed and stored in a locked cupboard or room properly labeled. It will not be replaced in service without prior wipe testing, or
2. Removed and returned to the manufacturer for disposal.

In either case, the services of the manufacturer's representative will be obtained to supervise removal, reinstallation, and/or packaging for return to the manufacturer.

15. RADIATION PROTECTION PROGRAM

The source holders will be received and stored pending arrival of Manufacturer's Field Engineer. The source holders will be installed in the closed position under the supervision of the representative. A written procedure for prevention of entry into the vessel when the source is in the open (source exposed) position will be prepared. This program will be developed in consultation with the manufacturer's representative.

The initial radiation survey will be made by the representative at the time of placing the device in service. An occupancy evaluation will be made by the representative and should film badges appear to be required, they will be obtained. Form NRC-3 will be posted and should the radiation survey with the vessel(s) empty reveal radiation fields in excess of 5 mr/hr at 12 inches from the surface of the vessels, appropriate warning signs will be posted. Procedures will be adjusted to reduce the total dose to personnel to the minimum reasonably achievable. A copy of the radiation survey and written procedures will be kept on file for future reference.

In case of malfunction of the source holder or damage thereto, the services of manufacturer's representative will be obtained for repair or to supervise removal and proper packaging for return to the manufacturer for repair or replacement as required.

In case of emergency such as fire or explosion involving apparent damage to the source holder, the appropriate Regional Office of Inspection and Enforcement (10 CFR 20 Appendix D), USNRC, will be contacted for assistance. The area around the source holder will be barricaded. The services of a manufacturer's representative will be obtained to assist in inspection for damage and local health authorities will also be notified.

WIPE TEST PROCEDURE - A test will be performed on the surface of the source holder at the appropriate interval by the individual user listed in the application in accordance with the instructions of the manufacturer's representative and contained in the gage instruction manual. The wipe test kit to be used in The Ohmart Model LT had the wipe will be evaluated for leakage by The Ohmart Corporation. Should the presence of 0.005 microrcuries of removable contamination be detected, the source holder will be withdrawn from service, the Regional Office of the USNRC notified and the device repaired or replaced by the manufacturer.

CUSTOMER ASSISTANCE SAMPLE (C)

NOTE: Shows typical examples combined for DensART, LevelART, WeighART & WebART

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. Complete as shown on attached Byproduct Material License Attachment (Form SDFV5479)
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.

Attach Resume

Attach Resume

18. CERTIFICATE

(This item must be completed by applicant)

The applicant and any official executing this certificate on behalf of the applicant named in Item 2, certify that this application is prepared in conformity with Title 10, Code of Federal Regulations, Part 30, and that all information contained herein, including any supplements attached hereto, is true and correct to the best of our knowledge and belief.

WARNING.—18 U.S.C., Section 1001, Act of June 25, 1948; 62 Stat. 749; makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

a. LICENSE FEE REQUIRED
(See Section 170.31, 10 CFR 170)

b. CERTIFYING OFFICIAL (Signature)

c. NAME (Type or print)

(1) LICENSE FEE CATEGORY:

d. TITLE

(2) LICENSE FEE ENCLOSED: \$

e. DATE

U.S. NUCLEAR REGULATORY COMMISSION and
U.S. DEPARTMENT OF TRANSPORTATION

Regulations for Users of Nuclear Gages

GENERAL

The intent of this bulletin is to abstract and summarize regulations of the U.S. Nuclear Regulatory Commission concerning the use of radioactive material in gaging devices as manufactured by The Ohmart Corporation. A summary of pertinent Department of Transportation shipping regulations is also included. *

PURPOSE OF NRC REGULATIONS

To control the use and location of radioactive materials under its jurisdiction for the protection of public health and safety.

SCOPE OF THE NRC AND AGREEMENT STATE REGULATIONS

The NRC controls the ownership, use and transfer or disposal of all radioactive materials which are used or created in the atomic energy program. These include source material such as uranium and thorium and by-products such as Cesium-137, Cobalt-60, Strontium 90 and many others. Special nuclear material such as Plutonium 238 is under especially stringent regulation because it is fissionable in large quantities (many times the quantities used in gages). All control is through licensing.

* See Appendix C

The NRC does not control naturally occurring radioactive materials not connected with the program. Among these are Radium-226 and its decay series including, among others, Lead-210. The NRC does not have any regulatory authority over X-ray equipment or naturally occurring radioisotopes.

AGREEMENT STATES

The individual states are gradually taking over the regulation of all radiation emitting materials and devices including naturally occurring radioactive materials and X-ray equipment.

Under legislation enacted several years ago, it is provided that the NRC may pass control of various radioactive materials and sources of radiation to the various states, providing the state legislation meets NRC standards. The basic action here is the signing of an agreement with the NRC by the Governor of the state. This agreement covers legislation for the control of materials which has been enacted by the State Legislature. As of February, 1980, 26 states have become Agreement States. These are:

Alabama

Arizona

Arkansas

California

Colorado

Florida

Georgia

Idaho

Kansas

Nebraska

Nevada

New Hampshire

New Mexico

New York

North Carolina

North Dakota

Oregon

South Carolina

Kentucky

Tennessee

Louisiana

Texas

Maryland

Washington

Mississippi

Rhode Island

In addition to the above twenty- six Agreement States, there are several other states in which legislation is either pending, or is being considered.

In general, the legislation passed by the states has the same provisions as the NRC regulations with the State Public Health Organization substituted for the Nuclear Regulatory Commission. However, there is one marked difference. In virtually all Agreement States so far the State Legislation has included all sources of ionizing radiation. This means that naturally occurring materials such as radium, and X-ray equipment, not covered by ARC regulations, are covered by state regulations.

In the case of Agreement States, there is no contact with the NRC. All dealings are with the state agency. We have included Appendix B showing to what organization correspondence should be addressed in each state to obtain license application forms and instructions.

In addition to the total control exercised by Agreement States, most states provide for the registration of radioactive isotopes or sources of ionizing radiation. Details of the registration requirements may be had by writing to the appropriate State Department of Public Health.

All Agreement States accept the NRC General License gages.

LICENSES

GENERAL LICENSE

The concept of a General License is very confusing and often misunderstood. We usually think of a license as something we carry in our billfolds or hang on our auto bumpers that proves we have paid a periodic fee permitting us to engage in some activity. The regulations of the USNRC (and the "Agreement States") contain numerous paragraphs such as 10CRF31.5, partially quoted below, which have the effect of issuing a license under certain conditions without any documentation. Part of 10CRF31.5 is quoted below:

"31.5 (a) Subject to the provisions of this section, a general license is hereby issued to own, receive, acquire, possess and use by-product material when contained in devices designed and manufactured for the purpose of detecting, measuring, gauging or controlling thickness, density, level, interface location, radiation, leakage, or qualitative or quantitative chemical composition, or for producing light or an ionized atmosphere.

(b) The general license contained in this section applies only to devices which have been:

(1) Manufactured in accordance with the specifications and contained in specific license issued by the Commission to the manufacturer of the device pursuant to 32.51 of this chapter, or in accordance with the specifications contained in a specific license issued to the manufacturer by an Agreement State which authorizes the manufacture of the

device for distribution to persons generally licensed by the Agreement State; and (2) Installed on the premises of the general licensee by a person authorized to install such devices under a specific license issued to the installer by the Commission pursuant to Parts 30 and 32 of this chapter or by an Agreement State if a label affixed to the device at the time of receipt states that installation by a specific licensee is required. The requirement of this subparagraph (2) does not apply while devices are held in storage in the original shipping container pending installation by a specific licensee."

OHMART GENERAL LICENSE GAGES

Note subparagraph (b) (1). The Ohmart Corporation has a specific license #34-00639-03G to distribute certain devices to General Licensees.

In general, gages manufactured for distribution to a General Licensee must have a radiation field low enough that personnel are not apt to receive a radiation dose in excess of 0.5 rem/year. 5 MR/HR at 12" from the surface in most installations meets this requirement and is the accepted criteria.

Referring to 10CFR31.5 (b) (2), quoted, gages distributed to General Licensees must bear certain labels setting forth the restrictions governing installation, leak testing and service to the source holder.

A typical label is shown on the following page.

Note in paragraph 4 that any person may mount this gage in place

FOR A DETAILED EXPLANATION OF THIS LABEL, READ
OHMART INSTRUCTION MANUAL.

SECTION RS

RECEIPT, POSSESSION, USE AND TRANSFER OF THIS
DEVICE ARE SUBJECT TO A GENERAL LICENSE OR
EQUIVALENT AND REGULATIONS OF THIS U.S. NRC OR AN
AGREEMENT STATE.

ABANDONMENT OR DISPOSAL PROHIBITED UNLESS TRANS-
FERRED TO PERSONS SPECIFICALLY LICENSED BY THE
NRC OR AN AGREEMENT STATE.

OPERATION PROHIBITED IF THERE IS INDICATION OF,
FAILURE OF OR DAMAGE TO SHIELDING, OR SOURCE
CONTAINMENT.

ANY PERSON MAY MOUNT THIS DEVICE IN PLACE INITIALLY,
PROVIDED THE ON-OFF MECHANISM IS LOCKED IN THE
OFF POSITION. ALL OTHER DEVICE INSTALLATION, DIS-
MANTLING, RELOCATION, REPAIR AND TESTING INVOLV-
ING THE RADIOACTIVE MATERIAL, ITS SHIELDING AND
CONTAINMENT SHALL BE PERFORMED BY PERSONS SPEC-
SPECIFICALLY LICENSED BY THE NRC OR AN AGREEMENT
STATE.

DEVICE SHALL BE TESTED FOR RADIOACTIVE LEAKAGE
AND PROPER FUNCTIONING OF ON-OFF MECHANISM AND
INDICATOR AT INSTALLATION AND AT SOURCE REPLACE-
MENT BY PERSONS SPECIFICALLY LICENSED BY THE NRC
OR AN AGREEMENT STATE. THEREAFTER, TESTING SHALL
BE DONE AT NO LONGER THAN 3 YEAR INTERVALS,
USING PROCEDURES STATED IN THE INSTRUCTION MANUAL.

LOSS, THEFT OR TRANSFER OF THIS DEVICE AND FAILURE
OF OR DAMAGE TO THE SHIELDING, OR THE SOURCE
CONTAINMENT, MUST BE REPORTED TO THE NRC OR AN
AGREEMENT STATE.

THIS LABEL SHALL BE MAINTAINED ON THIS DEVICE IN
A LEGIBLE CONDITION. REMOVAL OF THIS LABEL IS
PROHIBITED

P/N LABLLI-0033568

initially. The initial tests and startup, however, must be performed by an individual specifically licensed to do so.

With most of Ohmart's Generally Licensed gages, the possessor may, after the initial startup, perform the required, periodic wipe tests and shutter mechanism checks.

SPECIFIC LICENSE

A specific License is a document issued to an applicant, authorizing a specific activity. The license outlines the activity which the licensee may pursue, type of device (or devices) the licensee may possess, and the limits within which the licensee may use such devices. It names a specific individual (or individuals) as user and names a Radiation Protection Officer who may be the same as one of the Individual Users. The Radiation Protection Officer is responsible for keeping of the various records required by the licensing authority. Requirements and instructions for making application for a Specific License are contained in Section 30.32 and 30.33. The most important requirement is 30.33 (a) which requires that the applicant be qualified by training and experience to use the material for which the license is requested. This training may be imparted by the Ohmart engineer at installation and/or start-up or at the periodic Ohmart Corporation training school.

The Specific License does not grant any privileges which are not actually stated. However, it is possible, after the required training, to have the Individual User or Users, and/or Radiation Protection Officer, granted the authority to make wipe tests or to supervise the installation, relocation or removal of gages. These privileges may be acquired in the original application,

providing they delineate training satisfactory to the NRC or Agreement State. A program satisfying these requirements is offered by The Ohmart Corporation.

TESTS TO BE PERFORMED ON NUCLEAR GAGES

There are two basic tests that must be performed on nuclear gages. The first is a radiation survey and occupancy evaluation of the installation. This is prepared immediately after installation, or placing in service, and is made by the Ohmart engineer or other licensed person. The purpose of this survey and evaluation is to obtain a radiation profile in relation to the device and to determine whether personnel monitoring is required.

The second test is a periodic test for leakage of radioactive material. This applies to all but gas sources such as KR-85. This test must be performed at intervals specified in the labelling on General Licensed gages or in the text of a Specific License. At the same time the operations of the ON/OFF mechanism (if any) must be tested. The basic interval for such tests is six months, however, most Ohmart source holders are approved for leak test at three year intervals.

Records of prescribed tests must be kept on file by the licensee and available to NRC inspectors on request.

RESTRICTED AREA AND POSTING

Section 20.202, "personnel monitoring," covers the definition of the various areas requiring personnel monitoring. The next section, 20.203, covers the posting requirements. The two areas concerning us are

"Radiation Area" and "High Radiation Area".

RESTRICTED AREA

A restricted area is an area where access is controlled for the purpose of protection from radiation.

The radiation limits defining a RESTRICTED AREA are:

Where an individual, when continuously present, would receive more than 2 mr/hr or 100 mr in seven consecutive days. This is determined from the initial field radiation survey.

Radiation Area is defined as any area accessible to personnel, in which there exists radiation at such levels that a major portion of the body could receive in any one hour a dose in excess of 5 millirem, or in any five consecutive days a dose in excess of 100 millirems. A radiation area need not be posted with "Caution, Radiation Area" signs provided the radiation level twelve inches from the source container or housing does not exceed 5 mr/hr.

High Radiation Area is defined as any area accessible to personnel where an individual could receive a dose in excess of 100 mr in any one hour to a major portion of the body.

The posting required in the areas above is, logically enough, "CAUTION-RADIATION AREA" for the radiation area and "CAUTION - HIGH RADIATION AREA" for the high radiation area. Both signs bear the standard radiation symbol, the magenta propeller on the yellow background.

In addition to the caution posting requirements, it is required that form NRC-3 (notice to employees) be posted in such locations as to assure that employees working in or frequenting restricted areas will observe the notice on the way to or from work.

Since most devices have a surface radiation level in excess of "unrestricted areas" limits, it is best to post this sign since it is not a caution sign but merely advisory in nature and not likely to cause concern.

PERSONNEL MONITORING

Personnel monitoring is required for any individual who:

Enters a "High Radiation Area"

Is apt to receive 25% of the maximum quarterly allowance of 1.25 rem (whole body). This is approximately 25 mrem/wk. and is based upon the survey and occupancy evaluation performed at time of startup.

RECORD KEEPING REQUIREMENTS

Federal or State regulation requires the following records to be kept on file for each nuclear device on site:

1. A record of the INITIAL RADIATION SURVEY made at time of start-up.
2. A record of the WIPE TEST CERTIFICATE shipped with each gage, certifying that the source has been wiped prior to shipment and found to have less than 0.005 uCi of removable contamination.

3. Records of all periodic wipe tests required to be performed.
4. A. For a gage under a SPECIFIC LICENSE, the user must either post or maintain available for employees' inspection a copy of the SPECIFIC LICENSE. If the license is not posted, then a notice must be posted stating that the license is available for inspection.

B. For a gage under a GENERAL LICENSE, the user must post or maintain available for employees' inspection a copy of the CURRENT Federal or Agreement State regulations. Regulations, in EFFECT AT SHIPMENT, are found in OHMART INSTRUCTION MANUAL shipped with the gage.
5. Records must be maintained concerning any SOURCE SHIPMENT FROM USER'S FACILITY. This record should include date of shipment, address to which the source was shipped, and any verification of receipt.
6. Records of personnel monitoring, when monitoring is required.
Personnel monitoring is required when:

A. A person must enter an area where 100 mr/hr field is present.

B. A person is apt to receive more than 25% of the allowable dose of 1.25 r/quarter, based on occupancy evaluation of the installation.

C. It is the policy of the company using the gage to do the monitoring.

In addition to the above routine requirements there are certain reports required on accidents or unusual occurrences. In the regulations these are broken down into "immediate notification" and "twenty-four hour notification" reports. For purposes of simplification, all should be considered as immediate notifications. Under these occurrences the user must notify the Director of Licensing and the appropriate Nuclear Regulatory Commission Operations Regional Office (which is listed in Appendix D Part 20 of the Regulations and Form NRC-3. After an accident or unusual occurrence, the user should check the regulations. If the regulations are not available for some reason it is best to telephone the Regulatory Operations Regional Office at once. The office should be told what occurred and asked what steps should be taken. The user can also telephone The Ohmart Corporation, but is not required to do so. Basically the reports must be made as follows:

Immediate Notification. (Telephone and telegraph)

1. Theft or loss of licensed material.
2. Exposure of the whole body to 25 rems or more; or exposure of the skin to 150 rems or more; or exposure of the feet, ankles, hands or forearms to 375 rems or more.
3. The release of radioactive material which if averaged over twenty-four hours would be in excess of 5000 times the limitations in Appendix B, Table 2 of CFR Part 20.
4. A loss of one working week or more of any facilities due to a radiation incident.
5. Damage to property in excess of \$100,000.00 due to a radiation incident.

Twenty-Four Hour Notification

1. Exposure of whole body to 5 rems or more, the skin to 30 rems or more or feet, ankles, hand or forearms to 75 rems or more.
2. Release of radioactive material in concentration which if averaged over twenty-four hours would be in excess of 500 times the limit specified in Appendix B, Table 2.
3. A loss of one day or more of operation of any facilities due to a radiation incident.
4. Damage to property in excess of \$1,000.00 due to a radiation incident.

In addition to the above, where personnel monitoring is required, the employer must report to former employees, on request, the former employee's exposure to radiation as shown in the records maintained by the licensee. Naturally, if such a record is not required to be maintained, no reporting responsibility is indicated. Most Ohmart gages do not require monitoring.

The employer is also required to report, to the Director of Licensing, U.S. Nuclear Regulatory Commission, Washington, DC, 20545, with a copy to the Director of appropriate Nuclear Regulatory Commission Regulatory Operations Regional Office each exposure of an individual to radiation or concentrations of material in excess of any applicable limit in the above requirements or in the user's license. He is also required to report any incidents on which notification is required above.

There are certain other reporting requirements which govern, primarily, the use of radioactive materials other than in a sealed source. These would also apply in case of source leakage, the probability of which is quite remote. However, this information can be obtained from Section 20.405 of the regulations.

INSPECTION

The JIRC maintains a staff of inspectors, called Compliance Officers, who periodically visit user's establishments and inspect their installation and their records. Any deviation from the regulations is reported by these officers to the Regulatory Operations Regional Offices. Recently, these inspections are becoming somewhat painstaking. This is good. It assures the user that his records and his installations are in good shape and protects him from possible future problems in employee relations. In some cases, it might even protect him from lawsuits. However, this stepped-up activity also requires additional care and knowledge.

DISPOSAL

When a radioactive source is no longer required, it may be disposed of by any one of a number of approved disposal agencies. The easiest thing for Ohmart customers to do is to contact The Ohmart Corporation for instructions. In the case of generally licensed gages the dismantling of the device must be done under the supervision of an Ohmart engineer, or specifically licensed person. On specifically licensed gages, the provision of the license will govern whether or not the user may dismantle the gage. By "dismantling the gage" we mean removing and packing the source holder, in the closed position, of course. The Ohmart Corporation, or authorized disposal agency, will take care of getting rid of the source in an approved manner. Most of the authorized disposal agencies are on the East and West coasts. For this reason, it might be more economical for a

for a user on the seacoast to use one of the authorized disposal agencies. It is also advisable for the user to get in touch with The Ohmart Corporation should they wish to merely store the source for a period of time. We can define to them the requirements for storage within their own plant.

U.S. DOT SHIPPING REGULATIONS PERTAINING TO
SHIPMENT OF RADIOACTIVE MATERIALS (Revised 12/9/80)

This pertains to all shipping and storage containers for Radioactive Material and all gages containing Radioactive Material.

Each package of radioactive material must be labeled on two (2) opposite sides, with a distinctive warning label which is selected based upon a radiation survey of the package (49CFR172.400).

Empty label is a white label with the word EMPTY printed across it.

Empty label is to be used on shipping and storage containers only. All shipping and storage containers must be labeled. Labels must be put directly over (must cover) previous labels. No need to say that all shipping and storage containers bearing this label must be empty.

RADIOACTIVE I LABEL

Is a white label with the Radiation symbol on it and "Radioactive I" printed across it.

RADIOACTIVE II LABEL

Is a white and yellow label with the Radiation symbol on it and "Radioactive II" printed across it.

RADIOACTIVE III LABEL

Is a white and yellow label with the Radiation symbol on it and "Radioactive III" printed across it.

One of the above Radioactive classification labels is to be put on all boxes used for shipping gages containing Radioactive Materials and all shipping and storage containers used for shipping radioactive Material.

RADIOACTIVE MATERIAL PACKAGES LABEL CRITERIA

(D.O.T. 173.3999)

DOSE RATE LIMITS

LABEL	AT ANY POINT ON ACCESSIBLE SURFACE OF PACKAGE	AT THREE FEET FROM EXTERNAL SURFACE OF PACKAGE (TRANSPORT INDEX)
"RADIOACTIVE - WHITE I"	0.5 mR/hr	0
"RADIOACTIVE - YELLOW II"	50 mR/hr	1.0 mR/hr
"RADIOACTIVE - YELLOW III"*	200 mR/hr	10 mR/hr

*Requires Vehicle Placarding. (This label mandatory for fissile Class III or large quantity package, regardless of dose rate levels.) (49CFR173.389)

The type of packaging to be used depends upon the form in which the source is classified. ("Special form" 49CFR173.394 or "Normal form" 49CFR173.395) and the transport group into which the source material is placed (49CFR173.390). The special form and normal form categories depend upon the construction of the source capsule itself.

The Transport Group is determined by the radiotoxicity of the material and other considerations. The following is a list of commonly used radioactive isotopes and their transport groups. (49CFR173.390)

Do not confuse "transport group" with the required radiation labels I, II or III. A label is selected based upon a radiation survey of the package, not based upon transport group.

<u>MATERIAL</u>	<u>TRANSPORT GROUP</u>
Cs-137	III
Co-60	III
SR-90	II
KR-85	III
AM-241	I
PB-210	II
Ra-226	I
Rm-147	IV
Fe-55	IV

The quantity of material involved and its form determines whether it must be Type A or Type B shipping container. The table below lists the upper limits for Type A and Type B quantities for the various Transport groups.

<u>TRANSPORT GROUP</u>	<u>TYPE A QUANTITIES</u> <u>CURIES</u>	<u>TYPE B QUANTITIES</u> <u>CURIES</u>
I	1 mCi	20
II	50 mCi	20
III	3000 mCi	200
IV	20,000 mCi	200
V	20,000 mCi	5000
VI & VII	1,000,000 mCi	50,000
*Special Form	20,000 mCi	5000

*NOTE: The table shows that you can ship up to 20 curies of "Special Form" as a type A quantity in a Type A package.

TYPE A PACKAGING (49 CFR 178.350)

Type A packaging is that which must be designed in accordance with the applicable general packaging requirements as prescribed in the regulations (49 CFR 173.393), and which must be adequate to prevent the loss or dispersal of its radioactive contents and to maintain its radiation shielding properties if the package is subjected to the defined "normal" conditions of transport. The regulations prescribe 49 CFR 173.398 the performance criteria to simulate these normal conditions of transport. Typically, as is seen, the Type A packaging provided for in the regulations is the purely performance-based DOT Spec. 7A, Type A general package, for which a shipper must make his own assessment of his particular package design against the performance requirements. The regulatory framework, therefore, provides for the use of all Type A packaging without specific regulatory approvals of the package designs via the use of

the DOT Spec. 7A performance specification. Additionally, foreign-made Type A packages are acceptable internationally, provided they are so marked as Type A, without specific approval by the competent national authority of either country.

Type A packaging is used for Type A quantities of radioactive material or up to 20 Curies in "Special" Form of Groups I, II, and III materials. Type A packaging generally means a package that will be of sufficient strength to stand the normal hazards of shipment without damage to the container, release of radioactive material or loss of shielding effectiveness. This can generally be accomplished by placing the source holder or gage in a heavy wooden box with nail closure (no hinges and padlocks) and preferably with a metal strap seal. Most Ohmart sourceholders are approved as US DOT 7A type A shipping containers.

SPECIAL FORM RADIOACTIVE MATERIALS (49 CFR 173.394)

What is meant by "special form" radioactive material? We see that "special form" materials are defined as materials, which, if released from a package, might present a hazard due to direct, external radiation, but due to their high physical integrity, would present very little hazard, if any, due to radiotoxicity as a result of spread of contamination. This high physical integrity could be the result of inherent property of the material, such as its being in massive, solid form or an acquired characteristic such as encapsulation as a sealed source.

Therefore, almost all Ohmart gages are "special form" because of the high integrity of the double encapsulated sealed source.

If there is any doubt about the gage being "special form" or if there is a question of it being of a Type B quantity, please contact The Ohmart Corporation.

Radioactive Classification labels are to be put on opposite sides of the box or container. If any previous labels exist from a previous shipment referring to Radioactive Classification they should be covered with the new labels ~~or~~ removed.

CONTENT BLOCK - All radioactive labels have a block that must be filled in stating the "material" and "activity" in curies.

TRANSPORT INDEX NUMBER - Radioactive II and III labels have Transport Index number blocks which must be filled in to the highest tenth of 1 MR/HR. The Transport Index Number is the number of MR/HR at 3 ft. from the surface of the box or container rounded off to the highest tenth of 1 MR/HR.

BILL OF LADING INFORMATION (49 CFR 172.200) see the attached sample bill of lading for required information. APPENDIX A.

MARKING REQUIREMENTS (49 CFR 172.300) Each package of radioactive materials which conforms to the requirements for type A or type B packages must carry the appropriate marking in $\frac{1}{2}$ " letters.

EXAMPLE: USA DOT 7A TYPE A
RADIOACTIVE MATERIAL

The radioactive material must be identified by proper shipping name on the package and marked with the appropriate hazardous material identification number.

EXAMPLE: RADIOACTIVE MATERIAL
SPECIAL FORM
NOS (NA9182)
(CS-137)

EXPORT SHIPMENT

Everything remains the same for Export as for Stateside with one exception. The Transport Index Number is the MR/HR at 3 ft. from the center of the box or container.

SPECIAL SOURCE MATERIAL

Some sources may have to be taken out of the gage and shipped in a special container. This pertains mostly to Beta source material such as AM, PM, LEAD, and KR. If any doubt whatsoever --- check to be sure.

Be sure that the warning labels describing the source and bearing the radiation "propeller" are removed from the gage and returned with the source. If such label is attached to the source holder, it can be sent back as is. If it is attached to the detector housing, or brackets, it must be removed and shipped with the source.

ATTENTION!

REMEMBER, THE CUSTOMER MUST COMPLY ALSO WITH THE CONDITIONS OF HIS LICENSE FROM THE NRC OR AGREEMENT STATE OR WITH GENERAL LICENSE REGULATIONS WITH REGARD TO REMOVAL AND DISPOSAL.

**AN INDIVIDUAL PACKING A DEVICE FOR SHIPMENT
MUST BE SPECIFICALLY LICENSED TO DO SO!**

CERTIFICATION BY SHIPPER

Carriers may not accept for transport any packages of radioactive materials which have not been properly certified by the shipper pursuant to 49 CFR 172.204. This certificate is relied upon by the carrier, as evidence that the packaging is in accordance with the regulatory requirements. In the case of air shipments, one signed copy of the shipper's certificate must accompany the shipment, with the originating air carrier retaining a second copy 49 CFR 175.30 and 175.35.

SEE APPENDIX A - EXAMPLES OF SHIPPING PAPERS.

STRAIGHT BILL OF LADING — SHORT FORM

ORIGINAL — NOT NEGOTIABLE

Shipper's No. _____

Carrier's No. _____

(Name of Carrier)

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of this Bill of Lading.

THE OHMART CORPORATION

From 4241 ALLENDORF DRIVE, CINCINNATI, OHIO 45209

at CINCINNATI, OHIO,

19

The property described below, in apparent good order, except as noted, contains no radioactive material, if packages unknown, marked, consigned, and destined as indicated below, which said carrier (the word carrier being understood throughout the contract as meaning any person or corporation in possession of the property under the bill of lading) is going to its usual place of delivery at said destination. If on its route, otherwise to deliver to another carrier on the route to said destination, it is mutually agreed, as to each carrier of all or any of said property, each of or any portion of it, to be subject to the terms and conditions of the Uniform Domestic Straight Bill of Lading (set forth (1) in DOT Form 350, and (2) in the applicable motor carrier classification or tariff if this is a motor carrier shipment).

Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back hereof, set forth in the classification or tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

Consigned to _____
(Mail or street address of consignee - For purposes of notification only.)

Destination _____ State _____ County _____ Delivery Address* _____
(*To be filled in only when shipper desires and governing tariffs provide for delivery thereat.)

Route _____

Delivering Carrier _____ Car or Vehicle Initials _____ No. _____

No. Packages	Kind of Package, Description of Articles, by Serial Marks, and Full Name	*Weight (Sub. to Car.)	Class or Rate	Ch. Col.	Principal Radioactive Contents	Activity of Contents	Transport Index	Type Label
	RADIOACTIVE MATERIAL SPECIAL FORM N.O.S. (Cs-137) NA9132	193 lb			Cs-137	50 mCi	.5	Yellow 11
	RADIOACTIVE MATERIAL							
	1. DO NOT PLACE UNDEVELOPED FILM WITHIN 15 FEET OF THIS CONTAINER.							
	2. This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation, according to applicable regulations of the Department of Transportation.							
	3. RADIOACTIVE MATERIAL, NOI, Item No. 164900 (The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding 40¢ per pound).							
	4. PLACARDS							
	ELECTRICAL INSTRUMENTS, NOI, Item No. 61700.							
	RECORDING DEVICES, NOI, Item No. 58240.							
	PRINTED MATTER							
	CUSTOMERS P.O. NO. _____							
	SHOP ORDER NO. _____							

Received \$ _____
to apply in prepayment of the charges on the property described hereon.

Agent or Cashier

Per _____
(The signature here acknowledges only the amount prepaid.)

Charges Advanced

\$ _____

If charges are to be prepaid, write or stamp here "To be Prepaid."

Subject to Section 7 of conditions of applicable bill of lading, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:
The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

(Signature of Consignor)

*If the shipment moves between two ports by a carrier by water, the law requires that the Bill of Lading shall state whether it is carrier's or shipper's weight.
NOTE—Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property.
The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding _____

per _____

†The fibre boxes used for this shipment conform to the specifications set forth in the box maker's certificate thereon, and all other requirements of the Consolidated Freight Classification.

† Shipper's imprint in lieu of stamp; not a part of Bill of Lading approved by the Interstate Commerce Commission.

THE OHMART CORPORATION, Shipper, Per _____ Received by _____

APPENDIX B

1/11/79

AGREEMENT STATES

The following is a list of Agreement States (states which have entered into agreements with the U.S. Nuclear Regulatory Commission (NRC), where NRC has relinquished authority and the states have asserted their own authority to regulate most radioactive materials within the state). Inquiries, or reports of proposed activities in these states concerning the materials listed on your NRC license, should be addressed to the State Officials listed below.

Became an
Agreement State
On -

10/1/66 Alabama 205-832-5992

Mr. Aubrey Godwin, Director
Division of Radiological Health
Environmental Health Adminis.
Room 314, State Office Building
Montgomery, Alabama 36130

2/1/68 Colorado 303-320-8333
Ext. 6246

Mr. Albert J. Hazle, Director
Radiation & Hazardous Waste
Control Division
Office of Health Protection
Department of Public Health
4210 East 11th Avenue
Denver, Colorado 80220

5/15/67 Arizona 602-255-4845

Mr. Donald C. Gilbert, Exec. Dir.
Arizona Atomic Energy Commission
2929 West Indian School Road
Phoenix, Arizona 85017

7/1/64 Florida 904-487-1004

Mr. Uray Clark, Administrator
Radiological Health Program
Health Program Office
Dept. of Health & Rehabilitative
Service
1323 Winewood Blvd.
Tallahassee, Florida 32301

7/1/63 Arkansas 501-661-2307

Mr. David D. Snellings, Jr., Dir.
Div. of Radiological Health
Arkansas Department of Health
4815 West Markham
Little Rock, Arkansas 72201

12/15/69 Georgia 404-894-5795

Mr. Charles F. Tedford, Dir
Radiological Health Unit
Department of Human Resources
47 Trinity Avenue
Atlanta, Georgia 30334

9/1/62 California 916-445-0931
License Insp.

Mr. Joe Ward, Chief - 916-322-2073
Radiologic Health Section
Department of Health
714 P. Street, Rm. 498
Sacramento, California 95814

10/1/68 Idaho 208-384-3335

Mr. Robert Funderburg, Superv.
Radiation Control Section
Idaho Department of Health
and Welfare
Statehouse
Boise, Idaho 83720

1/1/65	<u>Kansas</u>	913-862-9360 Ext-284	7/1/72	<u>Nevada</u>	702-885-4750
	Mr. Gerald W. Allen, Director Bureau of Radiation Control Division of Environment Dept. of Health & Environment Building 740, Forbes Field Topeka, Kansas 66620			Al Edmundson Radiological Health Consumer Health Protection Services Rm. 103 Kinkead Bldg Capitol Complex Carson City, Nevada 89710	
3/26/62	<u>Kentucky</u>	502-564-3700	5/16/66	<u>New Hampshire</u>	603-271-2281
	Mr. Charles M. Hardin, Manager Radiation Control Branch Bureau for Health Services Dept. for Human Resources 275 East Main Street Frankfort, Kentucky 40601			Mr. John R. Stanton, Director Radiation Control Agency Division of Public Health Services State Department of Health & Welfare State Laboratory Building Hazen Drive Concord, New Hampshire 03301	
5/1/67	<u>Louisiana</u>	504-925-4518	5/1/74	<u>New Mexico</u>	505-827-5271 Ext.-270
	Mr. B. Jim Porter Division of Radiation Control Natural Resources and Energy Dept. of Conservation P.O. Box 14690 Baton Rouge, Louisiana 70808			Dr. Ted Wolff, Chief Radiation Protection Section Environmental Improvement Div. P.O. Box 968 Crown Building Santa Fe, New Mexico 87503	
1/1/71	<u>Maryland</u>	301-383-2744/2735	10/15/62	<u>New York</u>	518-474-2178
	Mr. Robert E. Corcoran, Chief Division of Radiation Control Dept. of Health and Mental Hygiene 201 W. Preston Street Baltimore, Maryland 21201			Mr. T. K. DeBoer, Director Technical Development Programs New York State Energy Office Agency Building 2 Empire State Plaza Albany, New York 12223	
7/1/62	<u>Mississippi</u>	601-354-6657/6670	8/1/64	<u>North Carolina</u>	919-733-4283
	Mr. Eddie S. Fuente, Director Division of Radiological Health State Board of Health Jackson, Mississippi 39205			Mr. Dayne H. Brown, Chief Radiation Protection Section Division of Facility Service Box 12200 Raleigh, North Carolina 27605	
10/1/66	<u>Nebraska</u>	402-471-2168			
	Mr. Ellis Simmonds, Director Division of Radiological Health State Department of Health 301 Centennial Mall South P.O. Box 95007 Lincoln, Nebraska 68509				

9/1/69	<u>North Dakota</u>	701-224-2374	12/31/79	<u>Rhode Island</u>	401-277-2756
	Mr. Gene A. Christianson, Dir. Div. of Environmental Engineering Radiological Health Program State Department of Health 1200 Missouri Avenue Bismarck, North Dakota 58501			Mr. James E. Hickey, Chief Division of Occupational Health and Radiation Control Rhode Island Department of Health Cannon Building 75 Davis Street Providence, Rhode Island 02908	
7/1/65	<u>Oregon</u>	503-229-5797			
	Marshall Parrott, D.Sc. Manager Radiation Control Service Division of Health Dept. of Human Resources 1400 South West Fifth Avenue Portland, Oregon 97201				
9/15/69	<u>South Carolina</u>	803-758-5548			
	Mr. Heyward Shealy, Chief Bureau of Radiological Health State Department of Health and Environmental Control J. Marion Sims Building 2600 Bull Street Columbia, South Carolina 29201				
9/1/65	<u>Tennessee</u>	615-741-7812			
	Mr. J. A. Bill Graham, Director Division of Radiological Health Department of Public Health Cordell Hull State Office Building Nashville, Tennessee 37219				
3/1/63	<u>Texas</u>	512-458-7341 or 7686			
	David K. Lacker, Director Division of Occupational Health and Radiation Control Texas Department of Health Austin, Texas 78756				
12/31/66	<u>Washington</u>	206-753-3459			
	Mr. Robert C. Will, Supervisor Radiation Control Program Department of Social and Health Services Mail Stop LD-11 Olympia, Washington 98504				

APPENDIX C

SOURCES OF FEDERAL REGULATIONS

Title 49 Department of Transportation's Hazardous Materials
Regulations, Parts 100-199

Main Headings

- 49 CFR 170 - Rule-making Procedures of the Materials
Transportation Bureau
- 49 CFR 171 - General Information, Regulations and
Definitions
- 49 CFR 172 - Hazardous Materials Table and Hazardous
Materials Communications Regulations
- 49 CFR 173 - Shippers-General Requirements for
Shipments and Packagings
- 49 CFR 174 - Carriage by Rail
- 49 CFR 175 - Carriage by Aircraft
- 49 CFR 176 - Carriage by Vessel
- 49 CFR 177 - Carriage by Public Highway
- 49 CFR 178 - Shipping Container Specifications
- 49 CFR 179 - Specifications for Tanks Cars

Title 10 U.S. Nuclear Regulatory Commission

- 10 CFR 71 - Packaging of Radioactive Materials for
Transport and Transportation of
Radioactive Material Under Certain Conditions

Title 39 Postal Service, U.S. Postal Service Regulations, Part 12.
(Postal Regulations for Transport of Radioactive Matter re
published in U.S. Postal Service Publication #6, December
1975 and in the U.S. Postal Manual.)



UNITED STATES OF AMERICA ATOMIC ENERGY COMMISSION
Washington, D.C. 20545

NOTICE TO EMPLOYEES

STANDARDS FOR PROTECTION AGAINST RADIATION (PART 20); NOTICES, INSTRUCTIONS AND REPORTS TO WORKERS; INSPECTIONS (PART 19)

In Part 20 of its Rules and Regulations, the Atomic Energy Commission has established standards for your protection against radiation hazards from radioactive material under license issued by the Atomic Energy Commission. In Part 19 of its Rules and Regulations, the Atomic Energy Commission has established certain provisions for the options of workers engaged in AEC-licensed activities.

YOUR EMPLOYER'S RESPONSIBILITY

Your employer is required to—

1. Apply these AEC regulations and the conditions of his AEC license to all work under the license.
2. Post or otherwise make available to you a copy of the AEC regulations, licenses, and operating procedures which apply to work you are engaged in, and explain their provisions to you.
3. Post Notices of Violation involving radiological working conditions, proposed imposition of civil penalties and orders.

YOUR RESPONSIBILITY AS A WORKER

You should familiarize yourself with those provisions of the AEC regulations, and the operating procedures which apply to the work you are engaged in. You should observe their provisions for your own protection and protection of your co-workers.

WHAT IS COVERED BY THESE AEC REGULATIONS

1. Limits on exposure to radiation and radioactive material in restricted and unrestricted areas;
2. Measures to be taken after accidental exposure;
3. Personnel monitoring, surveys and equipment;
4. Caution signs, labels, and safety interlock equipment;
5. Exposure records and reports;
6. Options for workers regarding AEC inspections; and
7. Related matters.

REPORTS ON YOUR RADIATION EXPOSURE HISTORY

1. The AEC regulations require that your employer give you a written report if you receive an exposure in excess

of any applicable limit as set forth in the regulations or in the license. The basic limits for exposure to employees are set forth in Sections 20.101, 20.103, and 20.104 of the Part 20 regulations. These Sections specify limits on exposure to radiation and exposure to concentrations of radioactive material in air.

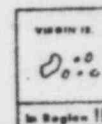
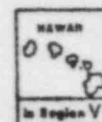
2. If you work where personnel monitoring is required pursuant to Section 20.202:
 - (a) your employer must give you a written report of your radiation exposures upon the termination of your employment, if you request it, and
 - (b) your employer must advise you annually of your exposure to radiation, if you request it.

INSPECTIONS

All activities under the license are subject to inspection by representatives of the AEC. In addition, any worker or representative of workers who believes that there is a violation of the Atomic Energy Act of 1954, the regulations issued thereunder, or the terms of the employer's license with regard to radiological working conditions in which the worker is engaged, may request an inspection by sending a notice of the alleged violation to the appropriate United States Atomic Energy Commission Regulatory Operations Office (shown on map at right). The request must set forth the specific grounds for the notice, and must be signed by the worker or the representative of the workers. During inspections, AEC inspectors may confer privately with workers, and any worker may bring to the attention of the inspectors any past or present condition which he believes contributed to or caused any violation as described above.

POSTING REQUIREMENT

Copies of this notice must be posted in a sufficient number of places in every establishment where activities licensed by the AEC are conducted, to permit employees working in or frequenting any portion of a restricted area to observe a copy on the way to or from their place of employment.



UNITED STATES ATOMIC ENERGY COMMISSION REGULATORY OPERATIONS OFFICES

REGION	ADDRESS	TELEPHONE	
		DAYS	NIGHTS AND HOLIDAYS
I	Region I, Directorate of Regulatory Operations, USAEC 631 Park Avenue King of Prussia, Pennsylvania 19406	215-337-1150	215-337-1150
II	Region II, Directorate of Regulatory Operations, USAEC Suite 818, 230 Peachtree St., NW Atlanta, Georgia 30303	404-526-4503	404-526-4503
III	Region III, Directorate of Regulatory Operations, USAEC 799 Roosevelt Road Clen Ely, Illinois 60137	312-852-2660	312-789-7711
IV	Region IV, Directorate of Regulatory Operations, USAEC 10395 West Colfax Avenue Denver, Colorado 80216	303-837-4211	303-237-5095
V	Region V, Directorate of Regulatory Operations, USAEC P.O. Box 1018 Berkeley, California 94701	415-486-8141	415-273-4237

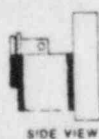
GENERAL

The source holders most commonly used by Ohmart are illustrated on this attachment by gage type and source holder model. If your source holder is not illustrated here, please contact the Radiation Safety Officer, Ohmart for additional information.

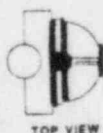
When performing a wipe test, wipe vigorously the outer surface of the source holder, especially at the seams and around the shutter mechanism on gages which have a shutter mechanism.

For Density Gages

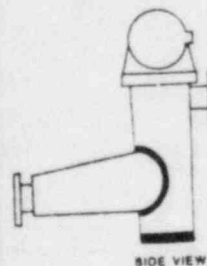
Source Holder SR Series



Source Holder HM Series



Source Holder ES Series



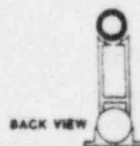
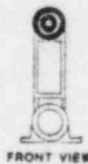
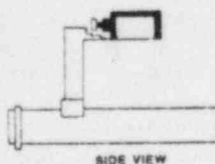
For Density Gages

Source Holder SR-1A Series



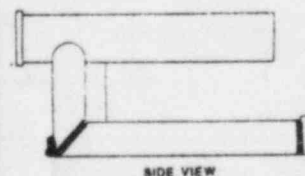
For Belt Scales

Source Holder SHWA



For Moisture (Belt) Gages

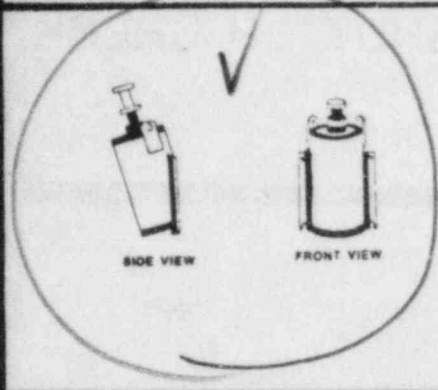
Source Holder SHRM Series



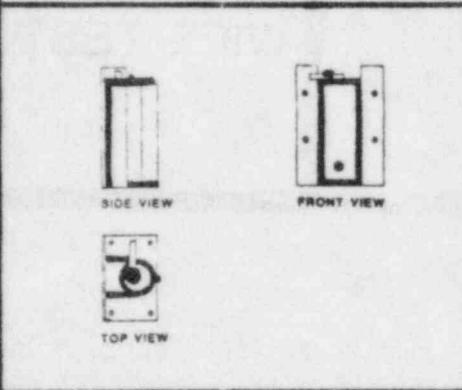
SDFV 9479

For Level Gages

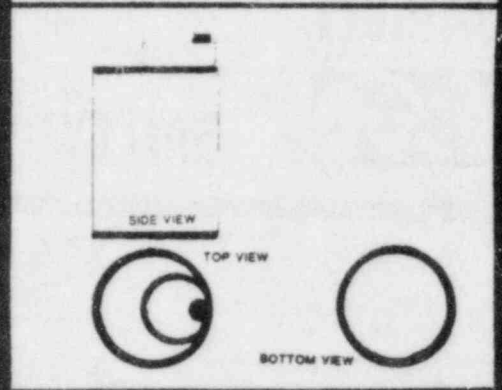
Source Holder SHLG Series



Source Holder SHRM Series

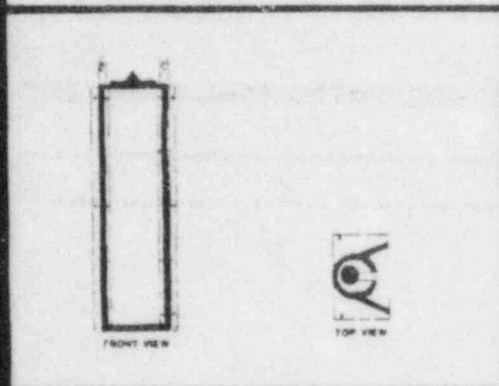


Source Holder SHRM-PA Series

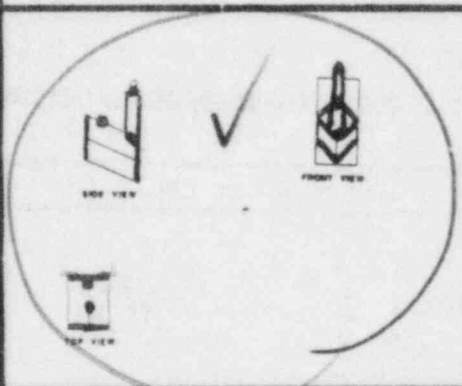


For Level Gages

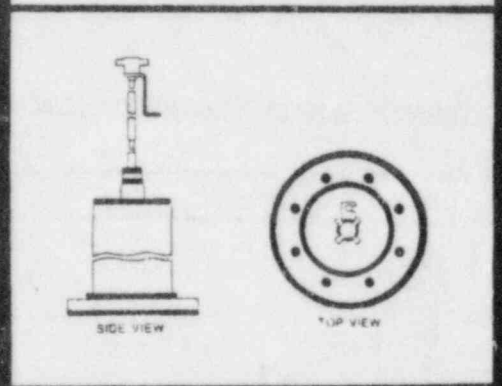
Source Holder SHRH Series



Source Holder SHD Series

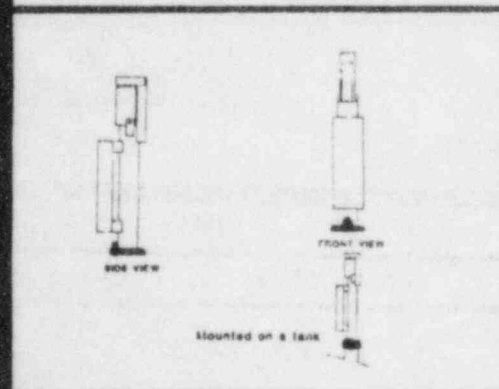


Source Holder SHLM-B Series

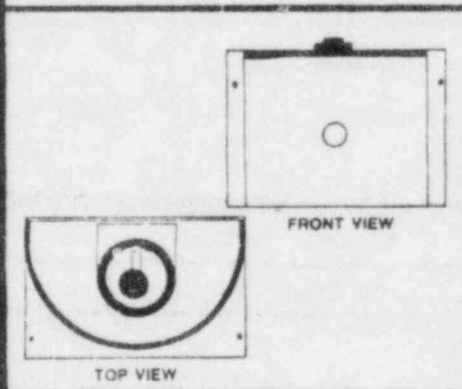


For Level Gages

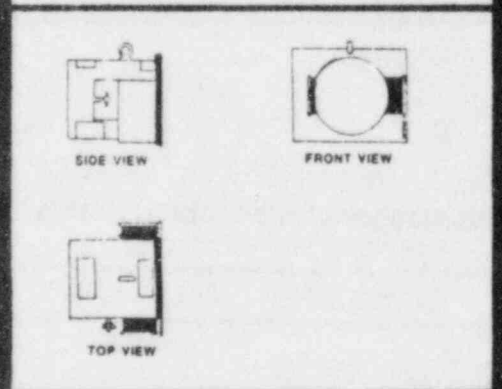
Source Holder SHLM-C Series



Source Holder SHRD Series

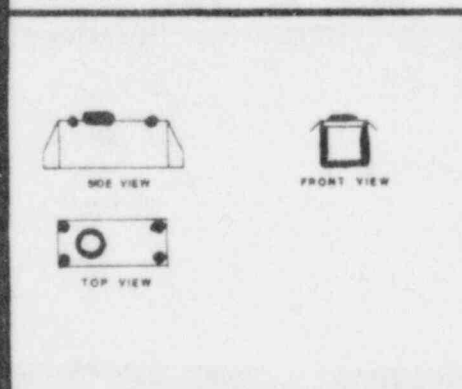


Source Holder SHGS Series

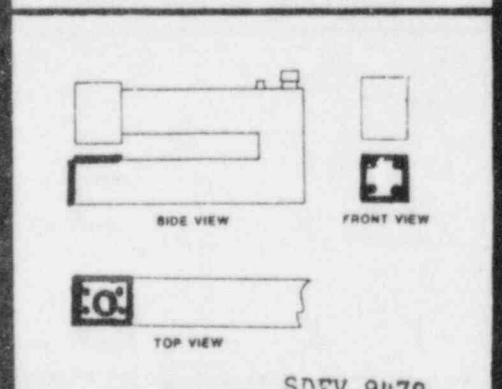


FOR BETA GAGES

Source Holder BAL Series



Source Holder BAL Series



SDFV 9479

DENSITY AND LEVEL GAUGE LEAK TEST CERTIFICATE

- NOTES:
- 1) NUMBERED POINTS INDICATE AREAS TO BE WIRED FOR LEAK TEST.
 - 2) ONCE COMPLETED, DATED AND SIGNED, THIS CERTIFICATE SHOULD BE MAINTAINED AS A PERMANENT RECORD.
 - 3) CHECK OPERATION OF SHUTTER WHEN LEAK TEST IS PERFORMED.

USER _____

GAUGE LOCATION _____

SOURCE HEAD MOD. NO. _____

TAG NO. _____

SOURCE HEAD SER NO. _____

ACTIVITY _____ mCi _____ C51327, _____ CO60

MEASURING INSTRUMENT _____

LEAK TEST TYPE _____

RESULTS _____

SHUTTER OPERATION - _____ OK _____

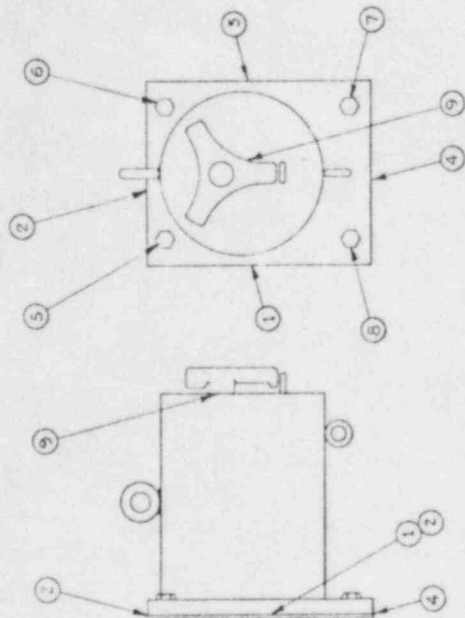
_____ NEGATIVE, _____ POSITIVE, _____ mCi

SIGNATURE (SIGN ONLY AFTER RESULTS ARE FILLED IN) _____ DATE _____

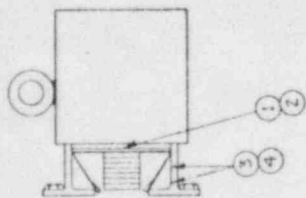
COMPANY NAME _____

COMPANY ADDRESS _____

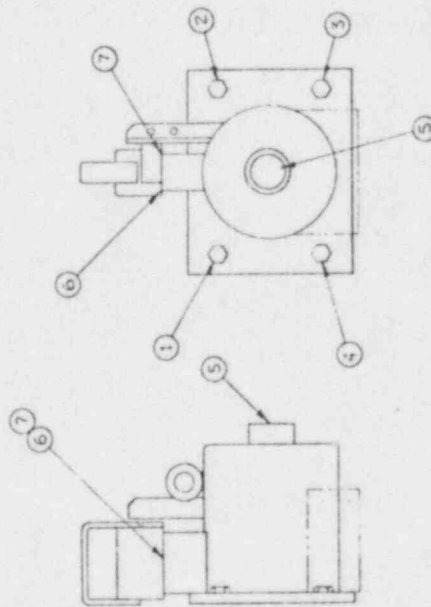
WITH AVAILABLE LEAK TEST KIT. MAIL TO:
 TEXAS NUCLEAR
 9101 HWY 180, AUSTIN TEXAS 78764
 PHONE (512) 838-8601, TELEX 77-6413



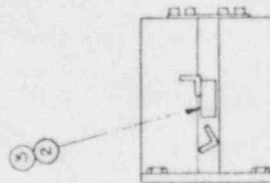
1, 2, 3, 4 - WIPE ALL AROUND GASKET
 9 - WIPE ALL AROUND SHUTTER HANDLE
 SOURCE HEAD NO. 5174, 5175, 5176



1, 2 - WIPE UP AND DOWN SHUTTER (AND/OR INSIDE EDGE OF HEAD IF EXPOSED)
 3, 4 - WIPE ALL ALONG INSIDE EDGE
 SOURCE HEAD NO. 5189, 5190, 5191, 5192, 5193, 5199



5 - WIPE ALL AROUND PLUG, EXCEPT ON 5178 OR 5181.
 6, 7 - WIPE ALL AROUND SHUTTER.
 SOURCE HEAD NO. 5178, 5179, 5180, 5181, 5182, 5183



1 - WITH SHUTTER CLOSED, WIPE ALL AROUND SEAM AND BOLTS TO THE EXTENT THAT THEY ARE ACCESSIBLE.
 2, 3 - WIPE ALL AROUND BOTH SHUTTER HANDLES.
 SOURCE HEAD NO. 5188

NOTES:

- 1) SURVEY LETTERED POINTS AT ONE FOOT FROM THE SURFACE AND/OR AT THE SURFACE.
- 2) SOME GEIGER TUBE TYPE SURVEY METERS MAY NOT HAVE SUFFICIENT RANGE TO TAKE SURFACE READINGS ON SOME APPLICATIONS. IN SUCH CASES, USE ION CHAMBER TYPE SURVEY METER OR TAKE READINGS AT ONE FOOT.
- 3) ONCE COMPLETED, DATED AND SIGNED, THIS CERTIFICATE SHOULD BE MAINTAINED AS A PERMANENT RECORD.

DATE _____

USER _____

GAUGE LOCATION _____

SOURCE HEAD MOD. NO. _____

TAG NO. _____

SOURCE HEAD SER. NO. _____

ACTIVITY _____ mCi _____ Cs137, _____ Co60

MEASURING INSTRUMENT _____

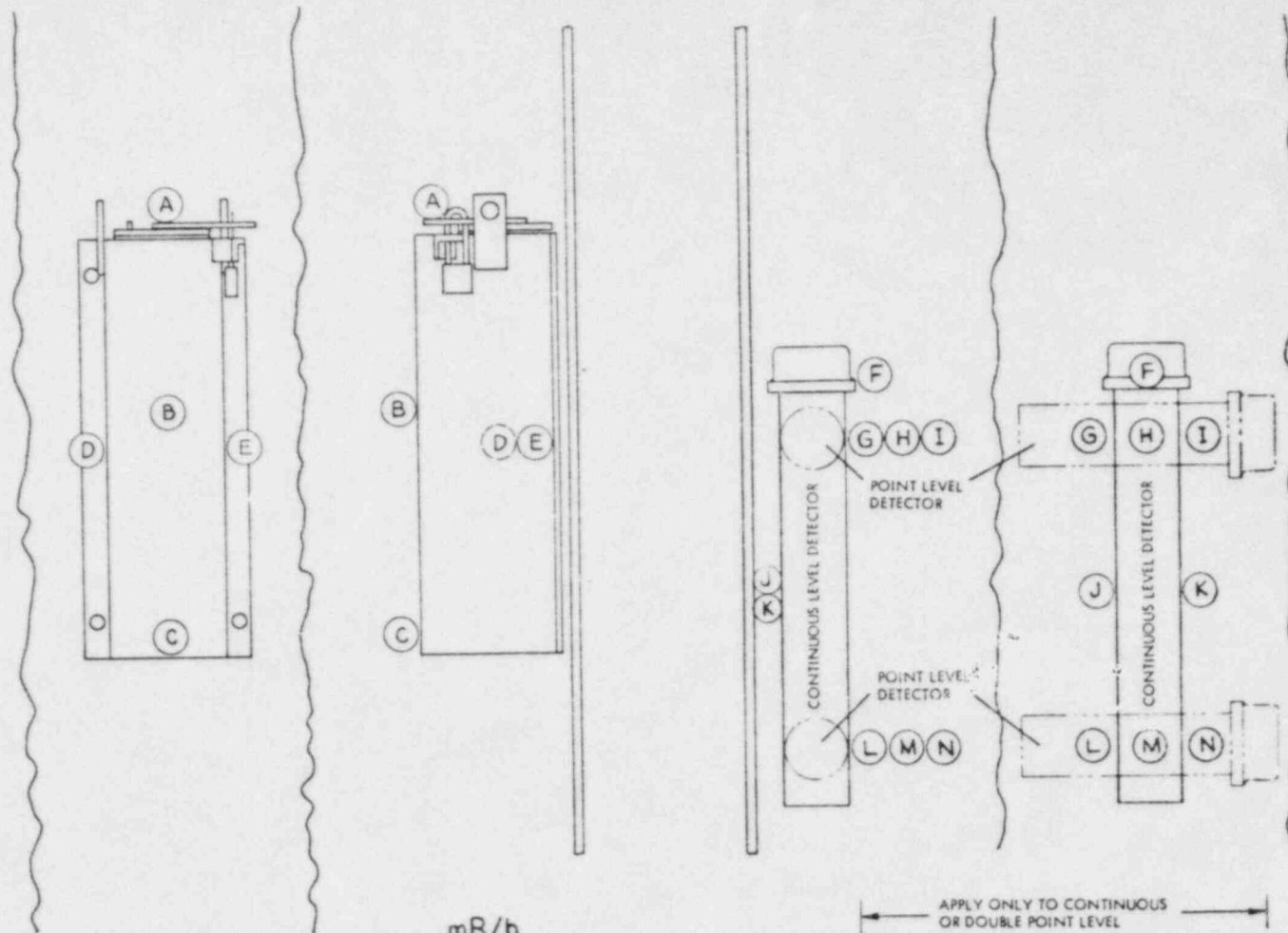
READINGS TAKEN: _____ AT SURFACE, _____ AT ONE FOOT

SIGNATURE (ONLY AFTER RESULTS RECORDED) _____ DATE _____

COMPANY NAME _____

COMPANY ADDRESS _____

LEVEL GAUGE RADIATION SURVEY CERTIFICATE



SHUTTER	A	B	C	D	E	F	G	H	I	J	K	L	M	N
OPEN														
CLOSED														

VESSEL; EMPTY ☐ ; FULL ☐

GAMMA RADIATION SURVEY

For use with:

Series: 5060 & 5070

Models:

Source Heads: 5174, 5175, 5176, 5186

Series No. _____ Model No. _____ Source Head No. _____

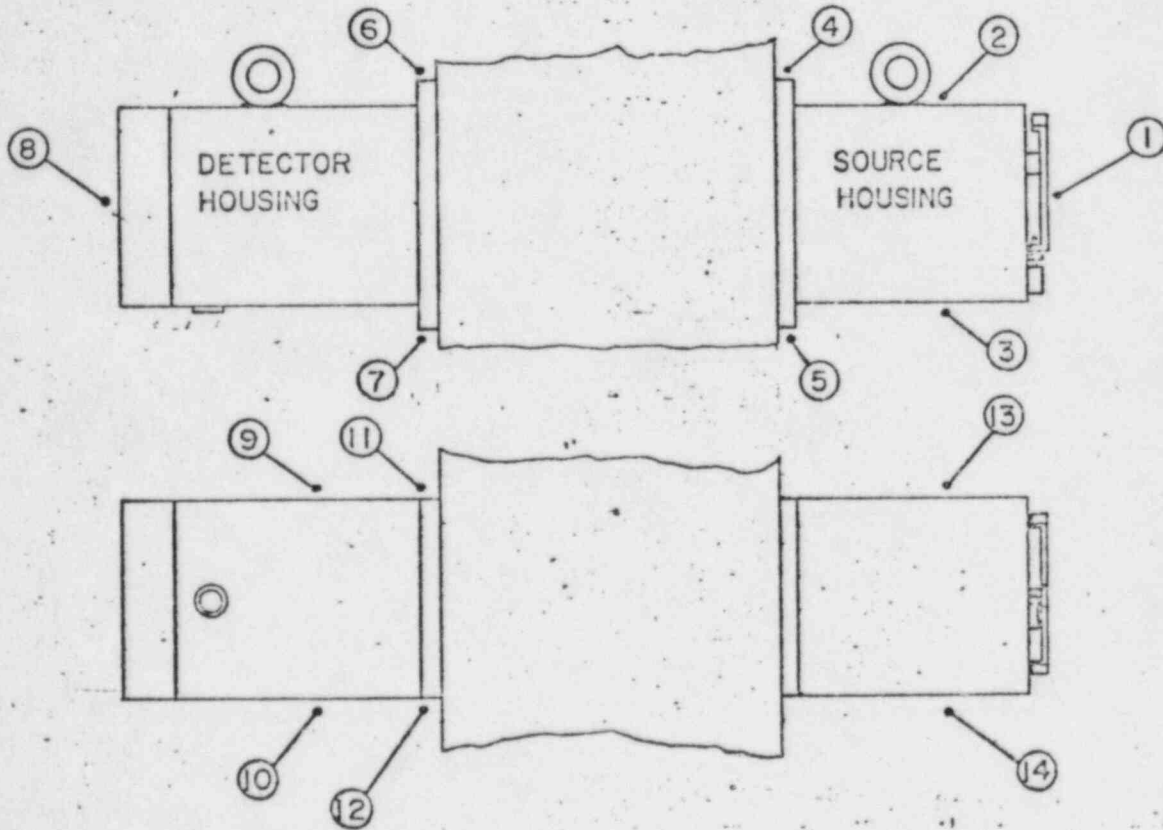
Device Serial No. _____ Isotope _____ Source Type _____

Activity _____ mCi Assay Date _____

Survey Instrument Type _____ Serial No. _____ Scale _____

LOCATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
SHUTTER OPEN																	
SHUTTER CLOSED																	

All readings in mr/hr. All readings on surface of device.



Date _____

Survey made by _____

BREAK ALL SHARP EDGES

UNLESS OTHERWISE SPECIFIED TOL ARE
DECIMAL FRACTIONAL ANGULAR

XX ± ±
.XX ± ±

MATERIAL

FINISH

ASSY USED ON

SCALE DWN BY DATE CHKD BY DATE APPD BY DATE DWN CHKD APPD

REVISIONS

STAMPED SERIAL DATA