NRC Form 313 I (12-81) 10 CFR 30

U.S. NUCLEAR REGULATORY COMMISSION

APPLICATION FOR BYPRODUCT MATERIAL LICENSE
INDUSTRIAL

See attached instructions for details.

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

1. APPLICATION FOR: *(Check and/or complete as appropriate)*

	a. NEW LICENSE
	b. AMENDMENT TO: LICENSE NUMBER
X	c. RENEWAL OF: LICENSE NUMBER 34-18156-01

2. APPLICANT'S NAME *(Institution, firm, person, etc.)*
Reuter-Stokes, Inc.
TELEPHONE NUMBER: AREA CODE – NUMBER EXTENSION
(216) 581-9400

3. NAME AND TITLE OF PERSON TO BE CONTACTED REGARDING THIS APPLICATION
George Palko, Vice President, Operations
TELEPHONE NUMBER: AREA CODE – NUMBER EXTENSION
(216) 581-9400

4. APPLICANT'S MAILING ADDRESS *(Include Zip Code)*
(Address to which NRC correspondence, notices, bulletins, etc., should be sent.)
18530 S. Miles Pkwy
Cleveland, OH 44128

5. STREET ADDRESS WHERE LICENSED MATERIAL WILL BE USED *(Include Zip Code)*
18530 S. Miles Pkwy
Cleveland, OH 44128

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

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

	FULL NAME	TITLE
a.	See Attachment for Item 6.	
b.		
c.		

7. RADIATION PROTECTION OFFICER
George Palko

Attach a resume of person's training and experience as outlined in Items 16 and 17 and describe his responsibilities under Item 15.
Vice President, Operations

8. LICENSED MATERIAL

LINE NO.	A ELEMENT AND MASS NUMBER	B CHEMICAL AND/OR PHYSICAL FORM	C NAME OF MANUFACTURER AND MODEL NUMBER *(If Sealed Source)*	D MAXIMUM NUMBER OF MILLICURIES AND/OR SEALED SOURCES AND MAXIMUM ACTIVITY PER SOURCE WHICH WILL BE POSSESSED AT ANY ONE TIME
(1)	See Attachment for Item 8.			
(2)				
(3)				
(4)				

	E DESCRIBE USE OF LICENSED MATERIAL
(1)	Items 1-22 are for use in testing of radiation detection instruments.
(2)	Item 23 is for use in gas chromatograph for sample analysis.
(3)	
(4)	

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9. STORAGE OF SEALED SOURCES

LINE NO.	A. CONTAINER AND/OR DEVICE IN WHICH EACH SEALED SOURCE WILL BE STORED OR USED.	B. NAME OF MANUFACTURER	C. MODEL NUMBER
(1)	See Figure 3.		
(2)			
(3)			
(4)			

10. RADIATION DETECTION INSTRUMENTS

LINE NO.	A. TYPE OF INSTRUMENT	B. MANUFACTURER'S NAME	C. MODEL NUMBER	D. NUMBER AVAILABLE	E. RADIATION DETECTED (alpha, beta, gamma, neutron)	F. SENSITIVITY RANGE (milliroentgens/hour or counts/minute)
(1)	Survey Meter	Nuclear Chicago	2588	One	Beta, Gamma	1-2500 mR/h
(2)	Survey Meter	Victoreen	491	Two	Beta, Gamma	0.1 - 100 mR
(3)	Survey Meter	Victoreen	490	Two	Alpha, Beta Gamma	0.05 - 20 mR
(4)	See Attachment for Item 10.					

11. CALIBRATION OF INSTRUMENTS LISTED IN ITEM 10

☒ a. CALIBRATED BY SERVICE COMPANY

NAME, ADDRESS, AND FREQUENCY

Items 1-3:
See Attachment for Item 11a.

☒ b. CALIBRATED BY APPLICANT

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

Item 4:
RS-SOP-880.2 and RS-SOP-880.3

12. PERSONNEL MONITORING DEVICES

A. TYPE (Check and/or complete as appropriate.)	B. SUPPLIER (Service Company)	C. EXCHANGE FREQUENCY
☒ (1) FILM BADGE	(1) Siemens Gammasonics, Inc. Health Physics Services Box 1367, Oakton St. Station Des Plaines, Illinois 60018	☒ MONTHLY
☐ (2) THERMOLUMINESCENCE DOSIMETER (TLD)		☐ QUARTERLY
☒ (3) OTHER (Specify): Bioassay	(2) Eberline Services Division P.O. Box 3874 Albuquerque, NM 87190	☒ OTHER (Specify): Quarterly; more often during peak periods.

13. FACILITIES AND EQUIPMENT (Check were appropriate and attach annotated sketch(es) and description(s).

☒ a. LABORATORY FACILITIES, PLANT FACILITIES, FUME HOODS (include filtration, if any), ETC.

☐ b. STORAGE FACILITIES, CONTAINERS, SPECIAL SHIELDING (fixed and/or temporary), ETC.

☐ c. REMOTE HANDLING TOOLS OR EQUIPMENT, ETC.

☐ d. RESPIRATORY PROTECTIVE EQUIPMENT, ETC.

14. WASTE DISPOSAL

a. NAME OF COMMERCIAL WASTE DISPOSAL SERVICE EMPLOYED

US Ecology or equivalent

See Attachment for Item 14.

b. IF COMMERCIAL WASTE DISPOSAL SERVICE IS NOT EMPLOYED, SUBMIT A DETAILED DESCRIPTION OF METHODS WHICH WILL BE USED FOR DISPOSING OF RADIOACTIVE WASTES AND ESTIMATES OF THE TYPE AND AMOUNT OF ACTIVITY INVOLVED. IF THE APPLICATION IS FOR SEALED SOURCES AND DEVICES AND THEY WILL BE RETURNED TO THE MANUFACTURER, SO STATE.

INFORMATION REQUIRED FOR ITEMS 15, 16 AND 17

Describe in detail the information required for Items 15, 16 and 17. Begin each item on a separate page and key to the application as follows:

15. RADIATION PROTECTION PROGRAM. Describe the radiation protection program as appropriate for the material to be used including the duties and responsibilities of the Radiation Protection Officer, control measures, bioassay procedures *(if needed)*, day-to-day general safety instruction to be followed, etc. If the application is for sealed source's also submit leak testing procedures, or if leak testing will be performed using a leak test kit, specify manufacturer and model number of the leak test kit.

16. FORMAL TRAINING IN RADIATION SAFETY. Attach a resume for each individual named in Items 6 and 7. Describe individual's formal training in the following areas where applicable. Include the name of person or institution providing the training, duration of training, when training was received, etc.

    a. Principles and practices of radiation protection.

    b. Radioactivity measurement standardization and monitoring techniques and instruments.

    c. Mathematics and calculations basic to the use and measurement of radioactivity.

    d. Biological effects of radiation.

17. EXPERIENCE. Attach a resume for each individual named in Items 6 and 7. Describe individual's work experience with radiation, including where experience was obtained. Work experience or on-the-job training should be commensurate with the proposed use. Include list of radioisotopes and maximum activity of each used.

18. CERTIFICATE

(This item must be completed by applicant)

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

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

a. LICENSE FEE REQUIRED *(See Section 170.31, 10 CFR 170)* $460.00	b. CERTIFYING OFFICIAL *(Signature)* George Palko
	c. NAME *(Type or print)* George Palko
(1) LICENSE FEE CATEGORY: 3F	d. TITLE Vice President, Operations - RSO
(2) LICENSE FEE ENCLOSED: $460.00	e. DATE 4-26-84

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ATTACHMENT FOR ITEM 6

	NAME	TITLE
a.	Hubbard Ford	Nuclear Test Supervisor Assistant Radiation Safety Officer
b.	Clark Gerber	Radio-Chemist
c.	Fred Glesius	Physicist
d.	Jan Orbin	Nuclear Test Engineer
e.	Melissa Patterson	Nuclear Project Engineer
f.	Arthur Stokes	Assistant to the President
g.	John Zilka	Staff Physicist

ATTACHMENT FOR ITEM 8

LINE NO.	ELEMENT AND MASS NUMBER A	CHEMICAL AND/OR PHYSICAL FORM B	NAME OF MANUFACTURER AND MODEL NUMBER (If Sealed Source) C	MAXIMUM NUMBER OF MILLICURIES AND/OR SEALED SOURCES AND MAXIMUM ACTIVITY PER SOURCE WHICH WILL BE POSSESSED AT ANY ONE TIME D
(1)	Americium 241	Sealed sources	Isotope Products Model L241SS	10 sources of 1.5 microcuries each in 1 holder
(2)	Americium 241	Foil	Isotope Products Model A1	1 source of 0.02 microcuries (standard)
(3)	Americium 241	Foil	New England Nuclear Model 300	0.00751 microcuries
(4)	Americium 241	Sealed source	Isotope Products Model L241-SS or Amersham NES Series or	1 source of 4 millicuries
			New England Nuclear AMC Series	
(5)	Any byproduct material	Neutron activated radiation detectors		250 millicuries total
(6)	Bismuth 207	Deposited on foil		1 source of 3 microcuries
(7)	Bismuth 210	Deposited on foil	New England Nuclear	1 source of 0.02 microcurie
(8)	Cadmium 109	Sealed sources	Amersham CUC Series Isotope Products PH109 Series	5 sources of 1 millicurie each
(9)	Carbon 14	Sealed sources	New England Nuclear	2 sources of 5 millicuries each
(10)	Cesium 137	Sealed sources	New England Nuclear	1 source of 98 microcuries
(11)	Cesium 137	Sealed sources	Nuclear Chicago 850233 or Monsanto MRC-G-SS-W-Cs	1 source of 40 millicuries
(12)	Cesium 137	Sealed source		One source of 113 nanocuries
(13)	Cobalt 57	Sealed sources	Isoptope Products PH157 Series Amersham CTC Series	5 sources of 20 millicuries each
(14)	Cobalt 60	Sealed source		1 source of 1 curie
(15)	Cobalt 60	Sealed sources	AECL C143 Type B2	2 sources of 10 curies each
(16)	Cobalt 60	Sealed sources	AECL C143 Type B2	1 source of 5 curies

ATTACHMENT FOR ITEM 8

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(17)	Cobalt 60			1 source of 0.23 millicuries
(18)	Hydrogen 3	Any		820 millicuries total
(19)	Iron 55	Sealed Sources	Isotope Products Model PH-55 Series	10 sources of 20 millicuries each
(20)	Krypton 85	Sealed source	Tracerlab S-70A	1 source of 500 millicuries
(21)	Strontium 90	Metal foil	MRC-B-AI-W	2 foils of 1.7 millicuries each
(22)	Neptunium 237	Foil	R/S (4.32 mg deposited)	1 foil of 3.1 microcuries
(23)	Hydrogen 3	Titanum tritide foils	Ionics Model 200 detector cells	2 foils of 130 millicuries each

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ATTACHMENT FOR ITEM 8

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(4)	Americium 241	Sealed source	Isotope Products Model L241-SS or Amersham NES Series or	1 source of 4 millicuries
			New England Nuclear AMC Series	
(5)	Any byproduct material	Neutron activated radiation detectors		250 millicuries total
(6)	Bismuth 207	Deposited on foil		1 source of 3 microcuries
(7)	Bismuth 210	Deposited on foil	New England Nuclear	1 source of 0.02 microcurie
(8)	Cadmium 109	Sealed sources	Amersham CUC Series Isotope Products PH109 Series	5 sources of 1 millicurie each
(9)	Carbon 14	Sealed sources	New England Nuclear	2 sources of 5 millicuries each
(10)	Cesium 137	Sealed sources	New England Nuclear	1 source of 98 microcuries
(11)	Cesium 137	Sealed sources	Nuclear Chicago 850233 or Monsanto MRC-G-SS-W-Cs	1 source of 40 millicuries
(12)	Cesium 137	Sealed source		One source of 113 nanocuries
(13)	Cobalt 57	Sealed sources	Isoptope Products PH157 Series Amersham CTC Series	5 sources of 20 millicuries each
(14)	Cobalt 60	Sealed source		1 source of 1 curie
(15)	Cobalt 60	Sealed sources	AECL C143 Type B2	2 sources of 10 curies each
(16)	Cobalt 60	Sealed sources	AECL C143 Type B2	1 source of 5 curies

ATTACHMENT FOR ITEM 8

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(21)	Strontium 90	Metal foil	MRC-B-AI-W	2 foils of 1.7 millicuries each
(22)	Neptunium 237	Foil	R/S (4.32 mg deposited)	1 foil of 3.1 microcuries
(23)	Hydrogen 3	Titanum tritide foils	Ionics Model 200 detector cells	2 foils of 130 millicuries each

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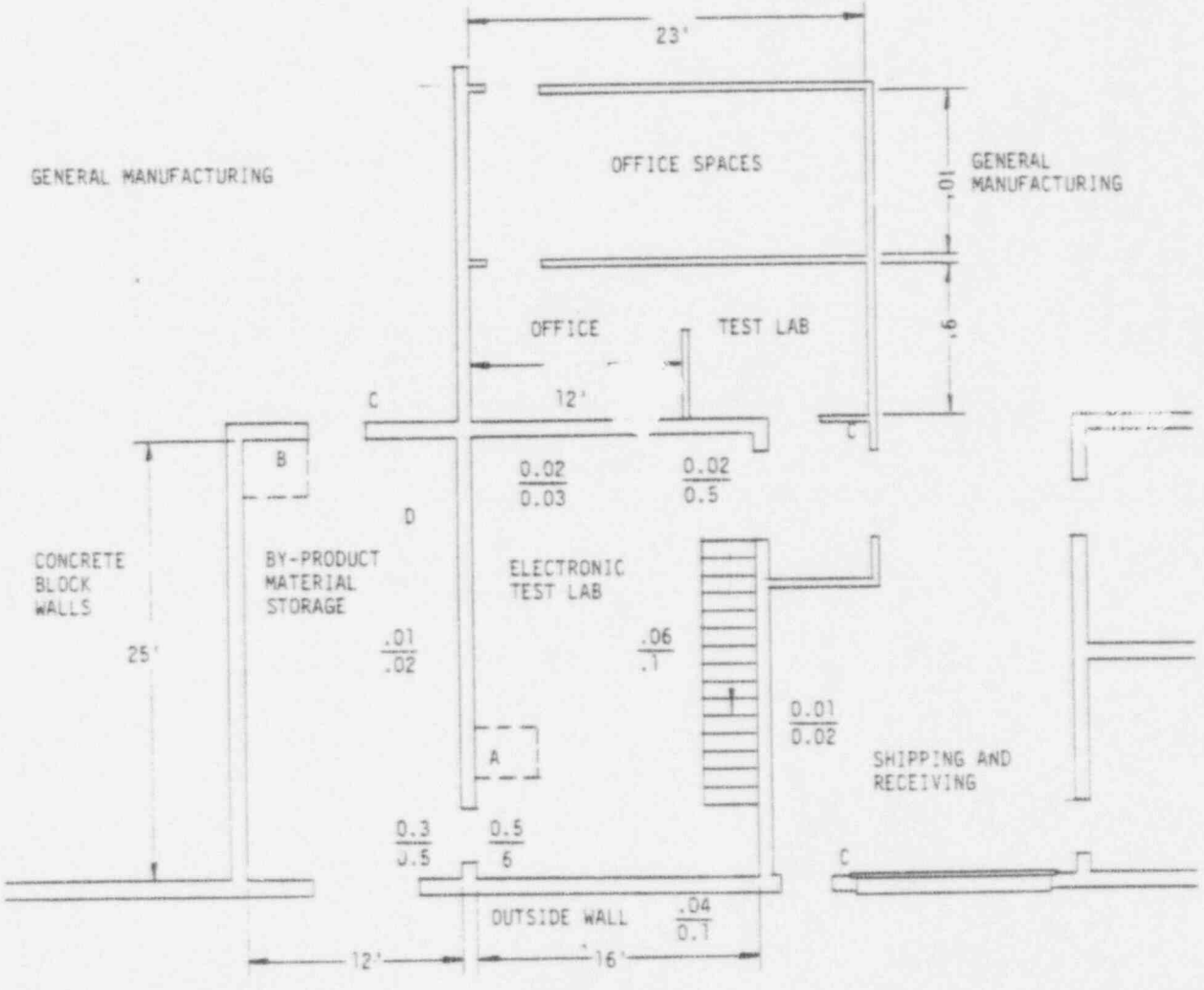
REUTER-STOKES, INC.
SKETCH OF ELECTRONIC TESTING LAB



GAMMA RADIATION LEVELS

NUMBERS ARE IN mr/Hr.

TOP NUMBERS WITH CO-60 SOURCE IN OFF POSITION.

BOTTOM NUMBER WITH CO-60 SOURCE IN "ON" POSITION.

A. PARAFFIN MODERATED TEST BOX FOR PuBe SOURCES
B. AREA FOR COUNTING OF WIPE SAMPLES
C. FIRE EXTINGUISHERS
D. LOW LEVEL WASTE STORAGE

SCALE: 1/8" = 1 FOOT

5-16-83

FIGURE 1

REUTER STOKES INC.

EMERGENCY PROCEDURES FOR RADIOACTIVE TESTING LAB

IN THE EVENT OF OVEREXPOSURE TO RADIOACTIVITY OR OTHER INCIDENT INVOLVING RADIOACTIVE MATERIAL, THE FOLLOWING STEPS ARE TO BE TAKEN:

1. IF THE INCIDENT INVOLVES EXPOSURE OR SUSPECTED EXPOSURE TO RADIATION BEYOND STANDARD LIMITS, LEAVE THE AREA AND CALL THE RSO OR ASSISTANT RSO IMMEDIATELY AT THE NUMBER LISTED BELOW.

2. IF THE INCIDENT INVOLVES DROPPING OR OTHERWISE DAMAGING A SEALED SOURCE, OR OTHER CONTAMINATION OF THE AREA OR PERSONNEL BY RADIOACTIVE MATERIAL, TURN OFF THE HEATING AND VENTILLATION SYSTEM, AND CALL THE RSO OR ASSISTANT RSO IMMEDIATELY.

3. REMOVE PERSONNEL FROM THE IMMEDIATE CONTAMINATED AREA, BUT DO NOT LEAVE THE GENERAL LAB AREA.

4. DO NOT ALLOW ANYONE INTO THE CONTAMINATED AREA WITHOUT EXPLICIT AUTHORIZATION FROM THE RSO OR ASSISTANT RSO.

5. THE RSO OR ASSISTANT RSO WILL SURVEY THE AREA AND PERSONNEL FOR TOTAL CONTAMINATION.

RADIATION SAFETY OFFICER (RSO)	GEORGE PALKO	EXT. 209	HOME PHONE
ASSISTANT RSO	HUBBARD FORD	EXT. 218	HOME PHONE

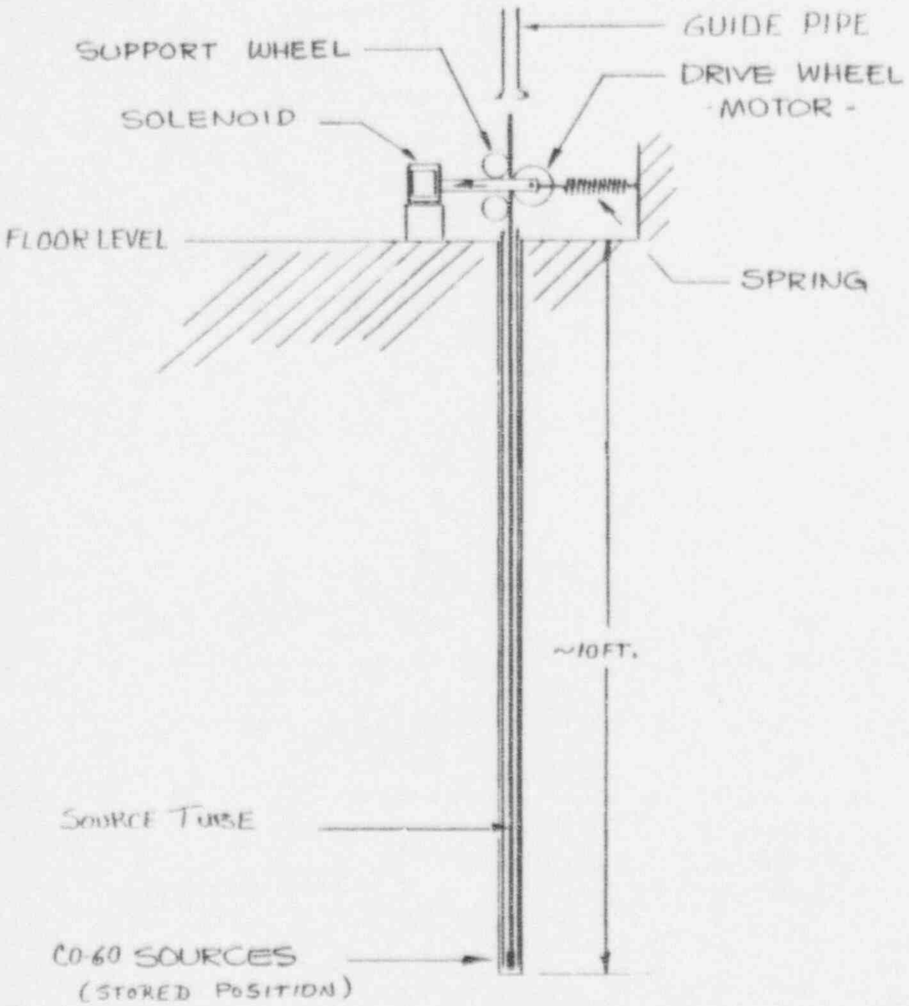


FIG. 3

1. Co-60 sources (✓ 15 ci) stored 10 feet below floor level when not in use.

2. Tests and experiments are set up with sources in stored position.

3. Source area protected by safety interlocks.

4. Source is raised by remote control from upper level.

5. System is designed so that weight of source holder drops the sources into the stored position in the case of power failure.

6. When solenoid loses power, mechanical spring pulls drive wheel away from source tube, and the sources drop.

The smaller check sources are stored in a lead lined safe manufactured by Atomic Development Corp. As necessary, sources may have their own lead containers, and these also are stored in the lead lined safe.

Sources are stored in the area described in Figure 1.

NOTES:
1 - REMOVE BURRS, BREAK EDGES WHEN APPLICABLE.

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES AND DIMENSIONAL LIMITS AS FOLLOWS:

SURFACE FINISH		XX DECIMAL	± .01
FRACTIONAL	± 1/64	.XXX	± .005
ANGULAR	± 0° 30'	.XXXX	± .0005

REUTER-STOKES CLEVELAND, OHIO 44128

TITLE

MAT'L.

DRAWN BY | DATE | CHECKED BY | DATE | APPROVED BY | DATE | SCALE | DWG. NO. | REV.

reuter stokes

ATTACHMENT FOR ITEM 10

Other Laboratory Counting Equipment and Monitoring Instruments:

Two Bicron 3 x 3 NaI (TI) well detectors in two inch lead shielding. Associated electronics for each are as follows:

1 Ortec Model 113 Preamp (or equivalent)
1 Ortec Model 485 Amplifier (or equivalent)
1 Canberra Model 1436 Single Channel Analyzer
1 Ortec Model 776 Timer Scaler (or equivalent)
1 Ortec Model 446 Power Supply (or equivalent)

One of these counters will be kept in a low background area. It will be used as the primary counter for all wipe testing, i.e. area, equipment, and sources (as necessary). The calibration is described in Attachment for Item 15, RS-SOP-880.3, Procedure for Wipe Testing Gamma Emmitters. Either system can be interfaced with a multichannel analyzer for the identification of unknown gamma radiation.

A 2Π geometry flow counter which is of Reuter-Stokes design and construction using P-10 gas. The system sensitivity is 0.5 counts/disintegration for alpha radiation. System electronics are as follows:

1 Ortec Model PC 109 Preamp or equivalent
1 Ortec Model 115 Power Supply
1 Ortec Model 410 Amplifier
2 Ortec Model 431 Timer/Scalers
1 Power Designs Model 2K20 Power Supply or equivalent

This system is used for evaluating the wipe testing of sources, air sample counting, and wipe testing of laboratory work areas. The system is calibrated prior to each use using an Am 241 alpha reference source, New England Nuclear Model 300, containing 0.00751 microcuries and an activity level of 1.67×10^4 dpm. The calibration method is described in Attachment for Item 15, RS-SOP-880.2, Procedure for Wipe Testing Alpha Emitters.

Reuter-Stokes Model RS-C4-1606-203 gamma ion chamber, Serial No. P-3561, with a sensitivity of 1.25×10^{-10} A/Rh established by N.B.S. on 1-2-74. This is used as a primary standard for gamma measurements.

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ATTACHMENT FOR ITEM 11a

1. Applied Health Physics, Inc.
   2986 Industrial Blvd.
   Bethel Park, PA

2. Nuclear Consulting Services
   6400/6800 Huntley Road
   Columbus, OH

Frequency of Calibration:

Items 1-3 of Section 10 are calibrated every six months or after each repair; as stated in Attachment for Item 15 (Instructions for Receipt and Utilization of Radioactive Materials, Section II).

Item 4 of Section 10 are calibrated prior to actual use as described in RS-SOP-880.2/3.

ATTACHMENT FOR ITEM 14

WASTE DISPOSAL

By-product waste material is disposed of by transfer to an authorized recipient, as provided in 10CFR 20.301 and other applicable sections. For the most part, the vast majority of waste generated by Reuter-Stokes is low level waste (LLW), such as wipes, swabs, gloves and other paraphenalia used in the wipe testing of sources and activated detectors.

NOTE: In December, 1980, the Congress enacted the Low-Level Radioactive Waste Policy Act of 1980, transferring from the federal government to the states the responsibility to dispose of commercial low-level radioactive waste (LLRW). The Act permits the states two options: each state may act unilaterally to dispose within its own borders of LLRW generated by institutions and industries in that state; or, the states may join together in interstate compacts to manage and dispose of these wastes on a regional basis.

The Act further provides that after January 1, 1986, a state acting unilaterally or a regional compact (E.G., the Northwest Compact, Rocky Mountain Compact, Southeast Interstate Compact) may exclude from their disposal facilities the LLRW generated outside their states.

The state of Ohio is an eligible state in the Midwest Interstate Compact on Low-Level Radioactive Waste along with 12 other states. They are Kentucky, Michigan, Indiana, Illinois, Wisconsin, Kansas, Missouri, Iowa, Nebraska, Minnesota, South Dakota and North Dakota.

Due to rapidly rising disposal costs and declining volume allocations at the three existing disposal sites, Ohio's radioactive waste generators may be faced with storage and disposal problems. Thus, a midwest regional low-level waste burial site needs to be developed as rapidly as possible.

Reuter-Stokes is a member of the Ohio Radioactive Materials Users Group (ORMUG). The radioactive material users of Ohio support the concept that adequate LLRW disposal facilities become available in this region. This will permit services and activities using radioactive materials to continue to operate for the benefit of Ohio's people. In the meantime also, to minimize insofar as possible the needed disposal facility, volume reduction processes and measures will be encouraged among radioactive material users. These processes include crystallization, dehydration, compaction and incineration.

ATTACHMENT FOR ITEM 14

The State Legislature of Ohio has adopted the Midwest Interstate Low-Level Radioactive Waste Compact. This compact will provide the cooperative effort among the eligible states and the facilities for proper low-level radioactive waste management in the region, while also protecting the safety and health of those living in the region.

ATTACHMENT FOR ITEM 15

REUTER-STOKES, INC.
RADIATION PROTECTION PROGRAM

Reuter-Stokes has a policy and program for assuring as low as reasonably achievable occupational radiation exposure. NRC Regulatory Guide 8.10 entitled "Operating Philosophies for Maintaining Occupational Radiation Exposures as Low as Reasonably Achievable" calls for the documentation of Management's commitment to the regulatory requirements of Part 20 of Title 10 of the Code of Federal Regulations. This policy, contained herein, is prepared, distributed, and supported in response to the above Guides and Regulations. It is hereby stated that it is the policy of the management of Reuter-Stokes, Inc. to conduct all operational activities involving utilization of radioactive materials in such a manner that as low as reasonably achievable (ALARA) occupational radiation exposure will be assured. The discussion which follows describes the manner in which this management commitment outlined above is administered.

Reuter-Stokes, Inc. has established a Radiation Safety Committee to assist the Radiation Safety Officer in achieving ALARA commitments. The Reuter-Stokes Radiation Safety Committee consists of the following members:

RADIATION SAFETY COMMITTEE:

F.W. Zalar, Vice President, Treasurer
J.C. Kroon, Vice President, Applied Research
G. Palko, Vice President, Operations

It is the responsibility of the Radiation Safety Committee to see that surveillance programs and investigations are conducted to insure that occupational exposures are as far below the specified limits as reasonably achievable.

The Radiation Safety Committee will meet at least quarterly. Minutes of the Radiation Safety Committee meetings will be documented and distributed to all applicable persons within the Reuter-Stokes Organization.

Special meetings of the Radiation Safety Committee may be scheduled as required for the discussion of items requiring timely consideration or for special topics that cannot be handled at a regular meeting. The distribution of information developed and/or scrutinized at committee meetings will be made to all personnel and all policies and standards will be implemented by the Committee members carrying out their individual duties and responsibilities.

The following items are examples of the functions that are performed by the Committee and its members for assuring ALARA exposures. It is not intended in any way to limit the scope of functions to be performed by the Committee.

ATTACHMENT FOR ITEM 15

(1) Review of Procedure
(2) Review of Sources of Exposure
(3) Review of Abnormal Exposures
(4) Review of Training
(5) Review of Job Preplanning
(6) Review of Job Results

It is the responsibility of Reuter-Stokes, Inc. to inform each individual employee of his/her responsibility to operate in a manner which keeps occupational exposures ALARA.

In addition, employees working with radioactive material belong to a group called the RADAC group, which meets on a regular basis to review and discuss the radiation safety aspects of their daily activities, and to recommend to the RSO any improvements to the Radiation Safety Program.

The overall responsibility for the safe use of byproduct materials has been assigned to the individual designated Radiation Safety Officer (RSO), George Palko, Vice President of Operations. This individual has the authority to control any and/or all operations in the interest of radiological safety and compliance with the provisions of existing Regulations and Guidelines. The Radiation Safety Officer or another individual designated by him that is qualified by training and experience will be responsible for the following duties:

a. Handle all contact with Federal, State, and Local Regulatory Agencies relative to the licensing and use of radioactive materials either directly or through his designated representative.
b. Control the procurement, use, storage, transfer, and disposal of all radioactive materials, including documentation.
c. Maintain adequate radiation survey instruments and see that each instrument is calibrated every six months and after each instrument servicing, and used properly for radiation surveys as needed.
d. Establish a routine and an emergency radiological safety survey program.
e. Establish and conduct the "Radiation Safety Training Program" and maintain up-to-date "Instruction to Reuter-Stokes Personnel" (See Attachments).
f. Supervise the leak testing of all sealed radioisotope sources on a 6 month basis, or as necessary to determine that operations are being conducted within safe limits and according to license requirements.
g. Notify appropriate regulatory agencies promptly of any accidents involving radioactive materials and provide reports as required.
h. Maintain an adequate supply of radiological safety equipment and enforce use as required.
i. Establish and maintain a medical control program for personnel which may include pre-placement, annual and termination physical examinations.

ATTACHMENT FOR ITEM 15

j. Assume control and institute corrective action in emergency situations. In the event of an emergency involving special nuclear material, the Radiation Safety Officer must assume full responsibility for:

(1) Developing effective radiation emergency plans to:
Promptly and accurately evaluate any unusual incident.
See that personnel receive immediate medical attention.
Limit the extent of radioactive contamination.
Manage all necessary accident repair and recovery operations.
Institute remedial action to prevent reoccurrence.
(2) Instructing all radiation personnel in what action they must take in an emergency.
(3) Providing ample emergency equipment, instruments, and protective devices.
(4) Knowing who to contact for medical, fire, and police assistance.
(5) Documenting the facts concerning the incident.
(6) Preparing the prescribed reports to regulatory agencies; management, and insurance carriers as required.

k. Supervise the personnel monitoring program, including issuance of dosimeters and maintenance of necessary records and reports. Review exposure reports from film badge service monthly.

Reuter-Stokes, Inc. has established a radiation safety training program for employees who independently carry out operations involving the utilization of radioactive materials. No employee will be assigned such duties until judged competent to do so.

The safety training program will consist of three phases:

a. Initial Training
b. On-The-Job Training
c. Periodic Training

The initial training/orientation program will consist of basic radiological safety education applicable to the operations performed at Reuter-Stokes, Inc. Subjects covered will include (but not be limited to):

a. Reuter-Stokes' policy concerning Safety and Reuter-Stokes' radiation protection program.
b. Related fundamentals of basic radiation physics, such as:
   1. Fundamentals of nuclear physics.
   2. Methods of controlling radiation exposure while utilizing radioactive materials contained within industrial gauging devices.
   3. Mathematics basic to the use and measurement of radiation sources.
   4. Biological effects of radiation.

ATTACHMENT FOR ITEM 15

c. Use of personnel monitoring equipment.
d. Radiation detection instrumentation.
e. Regulations and guidelines applicable to Reuter-Stokes' operations involving utilization of special nuclear materials.
f. Radiation safety operating procedures.

The on-the-job training program will consist of:

a. Reviewing the use of personnel monitoring devices.
b. Reviewing the use of radiation detection instrumentation.
c. Evaluation of packaged radioactive materials practices and procedures.
d. Proper storage of special nuclear materials at Reuter-Stokes' facility.

A periodic radiation safety training program will be conducted annually and will consist of reviewing:

a. Radiation safety practices and procedures.
b. Changes or ammendments to Reuter-Stokes' licenses.
c. Nuclear Regulatory Commission regulations.
d. Practices and procedures for receiving radioactive materials.
e. Changes in routine or emergency procedures.
f. Use of radiation instrumentation.
g. Use and practices relating to personnel monitoring devices.
h. Radiation form and reports required by licensing procedures and current regulations.

Should circumstances warrant, the contents of the training programs listed above may be modified to meet existing needs deemed appropriate to protect health and to minimize danger to life or property.

The documentation of periodic or refresher training provided, except for on-the-job, will be maintained. However, such documentation will not be maintained for a period longer then two years.

The Radiation Safety Officer will be responsible for establishing the radiation safety training programs. The training will be conducted by the Radiation Safety Officer or qualified persons designated by the Radiation Safety Officer.

ATTACHMENT FOR ITEM 15

INSTRUCTIONS FOR RECEIPT AND UTILIZATION OF RADIOACTIVE MATERIALS

I. UNDER NO CIRCUMSTANCES SHALL ANY REUTER-STOKES EMPLOYEE WORK WITH RADIOACTIVE MATERIALS UNLESS THAT PERSON IS WEARING THE PERSONNEL DOSIMETRY DEVICES ASSIGNED TO HIM FOR SUCH WORK.

Procedures for Use of Film Badges

The Radiation Safety Officer (RSO), or his designated alternate, will issue new film badge packets each month, presently the 25th day. The film badge from the previous month will be returned to the RSO when the new badge is issued. The film badge is not to be worn longer than one (1) month. The film badge will be identified by the worker's name, serial number and date of issue. The worker is to wear only his film badge and at no time will any individual exchange a film badge with another person. The film badge marked "Control" is not to be worn by any individual. Unless otherwise directed by the individual issuing the dosimeters, the film badge must be worn on the upper, front torso between the belt and neck. Wrist or ring badges will be worn as directed by the RSO. Deliberate tampering with personnel monitoring equipment that has been assigned to an individual or intentional exposures of such devices to radiation sources or falsifying an occupational radiation exposure record will be considered to be justification for discharge.

II. No Radiation Work is permitted without a calibrated and operable survey meter

No work involving radioactive material will be performed unless the radiation survey instrument is calibrated at intervals not to exceed six (6) months, and after each instrument servicing. Each survey meter has a label which indicates the data calibrated, recalibration due date and instrument serial number.

Prior to using a survey meter, perform the following steps:

Check the Calibration Information sticker on the survey meter to see that it has been calibrated within the last six (6) months. If the instrument has not been so calibrated, it must be returned to the RSO and another meter must be obtained.

The survey instrument should be checked as to operational response with the selector switch at various settings.

If the survey meter is damaged and is inoperable or is found to be unreliable, the instrument must be replaced.

ATTACHMENT FOR ITEM 15

III. Procedures for Receiving Radioactive Materials

Only the Radiation Safety Officer or an individual designated by him may order radioactive material to be delivered to Reuter-Stokes, Inc. The Radiation Safety Officer will determine if receipt of the radioactive material is permitted by Reuter-Stokes' current license (and inventory restrictions) and if any additional procedures, equipment, or license amendments are required before taking possession of the radioactive materials. Only after it has been determined by the Radiation Safety Officer that Reuter-Stokes may possess the radioactive materials will they be ordered.

When Reuter-Stokes expects to receive packages containing radioactive materials, the RSO or his designated representative shall make arrangements to receive the package(s).

> If the package is to be delivered to Reuter-Stokes' facility by the carrier, arrangements will be made to receive the package when it is offered for delivery by the carrier; or if the package is to be picked up by Reuter-Stokes at the carrier's terminal, arrangements will be made to receive notification from the carrier of the arrival of the package. When Reuter-Stokes receives notification from the carrier concerning arrival of packaged radioactive material it will be picked up immediately from the carrier's terminal.

Upon receipt, all packages containing radioactive materials will have the external surfaces of the packages surveyed for radiation levels, according to Procedure Number RS-SOP-880.1, Receiving Radioactive Materials.

The package survey will be performed by the RSO or his designated representative as soon as practicable after receipt, but no later than three (3) hours after the package is received at Reuter-Stokes' facility if received during normal working hours, or eighteen (18) hours if received after normal working hours. If either of the following survey limits are exceeded the Radiation Safety Officer shall, if required, immediately notify by telephone and telegraph the final delivering carrier and the appropriate regulatory agency.

> Removable radioactive contamination in excess of 0.01 microcuries (22,000 disintegrations per minute) per 100 square centimeters of package surface (any package of radioactive material). Radiation levels on the external surface of the package in excess of 200 mrem/hr, or at three (3) feet from the external surface of the package in excess of 10 mrem/hr.

ATTACHMENT FOR ITEM 15

IV. Radiation Monitoring

A. Radiation monitoring of the radioactive material storage room (area utilized by Reuter-Stokes for use and storage of byproduct material - see Figure 1) will utilize a RSS-1011 background radiation monitor modified with a variable set point to trigger an audible alarm (see brochure for Reuter-Stokes Sentri 1011).

B. The suppliers listed in Item 12 will furnish dosimetry and bioassay services as indicated. Reuter-Stokes is not committed to the suppliers listed and reserves the right to change such vendors at the Radiation Safety Officer's discretion.

The film badge service monitors for penetrating and non-penetrating X-ray, gamma and beta doses, and for fast neutrons. Exposure reports are evaluated monthly and include dose accumulation t o the skin and whole body. Monthly, quarterly, and year-to-date accumulated doses are provided. Notification level to the Radiation Safety Officer is 0.40 rem.

V. EMERGENCY PROCEDURES

Reuter-Stokes has posted, in both laboratory and storage areas, a copy of procedures to be used in case of emergency. The procedures outline the immediate action to be taken to prevent the release of radioactive material or further contamination of personnel and non-restricted work areas. A copy of the emergency procedure is submitted in Figure 2.