

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

U.S. NUCLEAR REGULATORY COMMISSION

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

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.

a. NEW LICENSE

b. AMENDMENT TO:
LICENSE NUMBER

X 29-02085-01

c. RENEWAL OF:
LICENSE NUMBER

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

Airco, Incorporated
Airco Industrial Gases
~~Rare & Specialty Gases Dept.~~
TELEPHONE NUMBER: AREA CODE - NUMBER EXTENSION

3. NAME AND TITLE OF PERSON TO BE CONTACTED
REGARDING THIS APPLICATION

John P. Borzio - Operations Manager
TELEPHONE NUMBER: AREA CODE - NUMBER EXTENSION
(609) 829-7914 - Ext. 202

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

(Address to which NRC correspondence, notices, bulletins, etc., should be sent.)

River & Union Landing Rds.
Riverton, New Jersey 08077

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

River & Union Landing Rds.
Riverton, New Jersey 08077

(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. Supplemental Sheet

b.

c.

7. RADIATION PROTECTION OFFICER

Jack B. Wert

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

8. LICENSED MATERIAL

L I N E	ELEMENT AND MASS NUMBER	CHEMICAL AND/OR PHYSICAL FORM	NAME OF MANUFACTURER AND MODEL NUMBER (If Sealed Source)	MAXIMUM NUMBER OF MILLICURIES AND/OR SEALED SOURCES AND MAXIMUM ACTI- VITY PER SOURCE WHICH WILL BE POSSESSED AT ANY ONE TIME
NO.	A	B	C	D
(1)	Hydrogen-3	Gas		200 Curies
(2)	Carbon-14	Any		1 Curie
(3)	Krypton-85	Gas		1,500 Curies
(4)	Xenon-133	Gas		20 Curies

DESCRIBE USE OF LICENSED MATERIAL

E

(1) 8507260015 850628
REG1 LIC30
29-02085-01 PDR PLEMENTAL SHEET

(2) License Fee Information
on Next Page

"OFFICIAL RECORD COPY"

03857

(4) ML10 MAY 28 1985

9. STORAGE OF SEALED SOURCES

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

10. RADIATION DETECTION INSTRUMENTS

LINE NO.	TYPE OF INSTRUMENT A	MANUFACTURER'S NAME B	MODEL NUMBER C	NUMBER AVAILABLE D	RADIATION DETECTED (alpha, beta, gamma, neutron) E	SENSITIVITY RANGE (milliroentgens/hour or counts/minute) F
(1)	SUPPLEMENTAL SHEET					
(2)						
(3)						
(4)						

11. CALIBRATION OF INSTRUMENTS LISTED IN ITEM 10

<input type="checkbox"/> a. CALIBRATED BY SERVICE COMPANY NAME, ADDRESS, AND FREQUENCY SUPPLEMENTAL SHEET	<input type="checkbox"/> b. CALIBRATED BY APPLICANT Attach a separate sheet describing method, frequency and standards used for calibrating instruments.
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12. PERSONNEL MONITORING DEVICES

TYPE (Check and/or complete as appropriate.) A	SUPPLIER (Service Company) B	EXCHANGE FREQUENCY C
<input checked="" type="checkbox"/> (1) FILM BADGE <input checked="" type="checkbox"/> (2) THERMOLUMINESCENCE DOSIMETER (TLD) <input type="checkbox"/> (3) OTHER (Specify): _____ 	SUPPLEMENTAL SHEET	<input type="checkbox"/> MONTHLY <input type="checkbox"/> QUARTERLY <input checked="" type="checkbox"/> OTHER (Specify): <u>SUPPLEMENTAL</u> <u>SHEET</u>

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.

SUPPLEMENTAL SHEET

14. WASTE DISPOSAL

- a. NAME OF COMMERCIAL WASTE DISPOSAL SERVICE EMPLOYED
SUPPLEMENTAL SHEET
- 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.

RECEIVED BY LFMB
 Date: June 17/85
 Log: June 17 9-I
 By: Jacques
 Orig. To: _____
 Action Compl. 6/17/85

Applicant: _____
 Check No. 008111 / 178606.9 (mp)
 Amount/Fee Category 30. \$110. / 110
 Type of Fee: Amendment
 Date Check Rec'd. 6/15/85 / 6/17/85
 Received By: Jacques / Jacques

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)

\$110.00

(1) LICENSE FEE CATEGORY:

3-A

(2) LICENSE FEE ENCLOSED: \$

\$110.00

b. CERTIFYING OFFICIAL (Signature)

c. NAME (Type or print)

JOHN P. BORZIO

d. TITLE

OPERATIONS MANAGER

e. DATE

5/20/85

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1. Radioisotopes will be diluted with inert and/or compatible gases to concentrations which will satisfy our customers' requirements. These gas mixtures will be distributed to Nuclear Regulatory Commission and/or agreement state licensed users in containers requested by our customers and permitted for shipment by the Department of Transportation and the Nuclear Regulatory Commission.
2. Kr-85, in the undiluted form, i.e., in the form received from our suppliers, will be transferred and/or distributed to the Department of Energy or a primary contractor of the Department of Energy. The transfer and/or distribution of Kr-85 will take place on-site at the location described/indicated in Item 5 of this license. The Kr-85 will be transferred and/or distributed in the sealed, whole package increments that are received from our suppliers.

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6.

- (a) JOHN P. BORZIO - OPERATIONS MANAGER
- (b) ROBERT E. EBERLY - ASSISTANT OPERATIONS MANAGER
- (c) JOHN L. WEBER - OPERATIONS FOREMAN

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Type of Instrument	Number Available	Radiation Detected	Sensitivity Range (mR/hr)	Window Thickness (mg/cm ²)	Use
Victoreen 490 Thyac III with 489-35 and window probe	1	Alpha Beta Gamma	0-20	1.4	Surveying
Victoreen 491 with 491-30 probe	2	Beta Gamma	0-100	30	Surveying
Victoreen 740F Cutie Pie	2	Alpha Beta Gamma	0-25,000	1	Surveying
Reactor Experiments 816 Digital Dosimeter	3	Gamma X-Ray	0-9999mR	---	Monitoring
Johnston Laboratories Triton 955-B	3	Beta Gamma	0-10,000 Micro Curies/M ³ Tritium	---	Monitoring
Canberra Series 35 Multi-Channel Analyzer with 802-4W Detector (3" X 3" NaI crystal)	1	Gamma	- - -	---	Analytical Work
Victoreen 845 Area Monitoring System	1	Gamma	0.1 - 10 ⁷	---	Monitoring
CL-1 Calibrator for Johnston Laboratories Triton 955-B	1	- -	- - -	---	Calibration
Tracor Analytic Delta 300 Liquid Scintillation Counter	1	Alpha Beta	- - -	---	Swipe counting and analytical work
Reactor Experiments 810-B Digital Dosimeter	2	Gamma X-Ray	1-10,000 mR	---	Monitoring

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METHOD, FREQUENCY AND STANDARDS USED IN CALIBRATING INSTRUMENTS

VICTOREEN 490

Calibrated by Radiation Management Corporation at intervals not greater than six months.

VICTOREEN 491

Calibrated by Radiation Management Corporation at intervals not greater than six months.

VICTOREEN 740-F

Calibrated by Radiation Management Corporation at intervals not greater than six months.

REACTOR EXPERIMENTS 816

Calibrated by Xetex, Inc. at intervals not greater than six months.

JOHNSTON LABORATORIES 955-B

Calibration checked using the Johnston Laboratories CL-1 calibrator designed to check this instrument. Calibration of instrument checked at intervals not greater than six months.

CANBERRA SERIES 35 MULTI-CHANNEL ANALYZER

Calibration checked monthly using aliquots of a Krypton-85 standard traceable to the National Bureau of Standards standard.

REACTOR EXPERIMENTS 810-B

These instruments will be used as a backup for the Reactor Experiments 816. If these instruments are used, they will be calibrated within six months by Xetex, Inc.

VICTOREEN 845 SYSTEM

Electrically checked daily. Calibration by Radiation Management Corporation at intervals not greater than six months.

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STANDARDS AVAILABLE

<u>Isotope</u>	<u>Activity</u>	<u>Estimated Error</u>	<u>Manufacturer</u>
Kr-85	1 to 3 mCi/liter	<u>+ 10%</u>	Gollob Analytical Service
Kr-85	2 to 5 mCi/liter	<u>+ 10%</u>	National Bureau Of Standards
H-3	4.63 micro Ci/liter	<u>+ 10%</u>	Johnston Laboratories

STANDARD SUPPLIERS

Gollob Analytical Service
47 Industrial Road
Berkeley Heights, New Jersey 07922

National Bureau Of Standards
Quince Orchard & Clopper Roads
Gaithersburg, Maryland 20878

Johnston Laboratories, Inc.
3 Industry Lane
Cockeysville, Maryland 21030

CALIBRATION SERVICE

Radiation Management Corporation
University City Service Center
3508 Market Street
Philadelphia, Pennsylvania 19104

Xetex, Inc.
660 National Avenue
Mountainview, California 94043

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FILM BADGES, DOSIMETERS AND BIOASSAY PROCEDURES

All employees who may be exposed to radiation in excess of 25% of 1.25 rem per calendar quarter in plant operations are provided with a film badge. Badges will be changed once a month. If any employee receives an exposure in excess of 400m rem per calendar quarter, their badge will be changed once every two weeks until that employee achieves an exposure of less than 400mrem per calendar quarter for two consecutive quarters. Badges will be developed by and results recorded by an outside agency. The current agency is:

R. S. Landauer, Jr. & Co.
Glenwood Science Park
Glenwood, Illinois 60425

All Radioactive Gas Technicians are provided with a cumulative digital dosimeter to be worn on their person at all times. They will read and record their indicated exposures at the end of each working day.

All Radioactive Gas Technicians are provided with thermoluminescence ring badges to be developed on the same schedule as their film badges.

All Radioactive Gas Technicians will submit samples for a urine bioassay for Tritium. Bioassays will be performed once a month. If the Tritium concentration exceeds 28 μ Ci per liter, bioassays will be performed twice weekly until the Tritium concentration falls below 28 μ Ci per liter. If at any time Tritium gas is filled, bioassays will be performed twice weekly for a period of at least one month after the last filling operation. The urine samples will be analyzed and recorded by an outside agency. The current agency is:

Temple University
Health Science Center
School of Pharmacy
Philadelphia, Pennsylvania 19140

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FACILITIES AND EQUIPMENT

Refer to General Diagrams A, B and C

13.1 GENERAL DESCRIPTION

The radioactive gas operations facility has been designed to separate operations for radioactive gases of differing hazards. Each radioactive gas filling operations area can be utilized independently and have independent monitoring systems. All doors open outward against the normal air flow and close automatically. All doors to the exterior of the building are fitted with dead bolt type locks. The door into the facility from the Radioactive Materials Office will be of self locking design with unique key access. All air entering the facility leaves through the stack. With all doors closed, the air flow is sufficient to change the total volume of air in the facility once every ten minutes.

13.2 RADIOACTIVE MATERIALS (RAM) OFFICE

The RAM Office is the main entrance to the radioactive gas filling facility for employees coming from the non-restricted work area. It will contain a desk for recordkeeping, shelves, a locker for storage and remote readout of all monitoring equipment (see Item 10).

13.3 KRYPTON-85 AND XENON-133 FILLING ROOM

The Krypton-85, Xenon-133 filling room is approximately 26 ft. by 25 ft. 8 in. composed of concrete block walls, filled and smooth finished. This finish coupled with a fiberglass sheet ceiling and proper electrical fixtures allows for complete washdown of this area. The floor is sloped to a drain which connects to a waste water storage tank in the east corner of the facility. The sink waste line also connects to this storage tank system.

The southwest wall of this room is a double course of solid 8 inch concrete block with joints completely filled with mortar and offset from one another. This coupled with the 12 inch hollow concrete block wall of the factory area will provide greater than four tenth value layers of shielding for 0.5 MeV gamma radiation. The storage area for Krypton-85 and Xenon-133 cylinders waiting for shipment is along this wall and has sides of double courses of 8 inch solid concrete block.

13.4 KRYPTON-85 AND XENON-133 STORAGE VAULT

The storage vault is approximately 8 feet by 16 feet with exterior walls composed of two courses of 8 inch solid concrete block. The wall common to the

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filling area is of similar construction. The two courses of block are offset and joints completely filled with mortar. An interior baffle, 6 feet high, of similar construction provides shadow shielding for the work area. The concrete block construction provides greater than 3.5 tenth value layers of shielding for 0.5 MeV gamma radiation. The room is vented with an independent blower system through the stack. A monitor connected to a chart recorder monitors the radiation level in the vault. The storage vault door will be lined with 1/4 inch lead with an alarm system to indicate unauthorized entry. The door will be automatically locking with unique key access.

13.5 TRITIUM AND CARBON-14 FILLING ROOM

The Tritium and Carbon-14 filling room is approximately 26 feet, 8 inches by 16 feet. The exterior wall is 12 inch hollow concrete block. The wall common to the Krypton-85 and Xenon-133 filling room is one course of 8 inch solid concrete block with joints completely filled with mortar. The waste water from sink and floor drain is collected in the storage tanks in the east corner of the building. Complete washdown is possible.

13.6 SHIPPING - RECEIVING AREA

The area designated for shipping and receiving is approximately 16 feet by 9 feet and is provided with a shower head and water lines to permit washdown of incoming and outgoing gas cylinders. Waste water from this operation is collected in the waste water storage tanks.

13.7 HOODS

Hoods for transfer of radioactive gases are provided in each filling room. All radioactive gas transfer operations will be conducted within the hoods by techniques common to the compressed gas industry. The hoods will be 72 inches wide, 44 inches deep and 6 feet, 4 inches high. The construction will be of 5/8" plexiglass and stainless steel. Each hood will have an independent blower system. The blower systems will be sufficient to maintain an air flow of greater than 100 linear feet per minute across the face with the doors open.

13.8 STACK

A stack 30 inches in diameter and 48 feet in height is provided at the northeast corner of the building. Effluents from each hood and storage vault will exit via this stack. Effluents are monitored for radioactive materials concentration (see Item 10).

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13.9 OUTSIDE STORAGE AREA

The area designated for an outside storage is the enclosed area around the waste water storage tanks. This area is enclosed by a 6 foot high chain link fence topped with 3 strands of barbed wire. Access to this area is through either one of two 3 foot gates which are locked to prevent unauthorized entry.

13.10 SIGN POSTINGS

All entrances to the facility are posted with a sign:

"CAUTION, RADIOACTIVE MATERIALS"

"CAUTION, RADIATION AREA"

"AUTHORIZED PERSONNEL ONLY"

This storage vault is equipped with an alarm system to indicate unauthorized entry and is posted with a sign:

"CAUTION, HIGH RADIATION AREA"

"AUTHORIZED PERSONNEL ONLY"

The outside storage area is posted on all four sides with signs:

"CAUTION, RADIATION AREA"

"CAUTION, RADIOACTIVE MATERIALS"

13.11 STORAGE VAULT ALARM SYSTEM

Refer to Alarm System Diagram.

The storage vault is equipped with an alarm system which will activate upon unauthorized entry. This alarm system is provided as an interlocking part of the Victoreen 845 Area Monitor System.

The ionization chamber type gamma detector (Victoreen 847-1) is located inside the storage vault above the entrance door. The remote alarm meter (Victoreen 848-5) is located adjacent to the storage vault and is capable of energizing a loud buzzer and red light through (S-1).

The readout module (Victoreen 946-2) is located in the RAM Office (see General Diagram A) together with remote readouts of all monitoring equipment.

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This unit will energize the remote alarm meter adjacent to the vault.

Switch (S-1) shall be adjusted to provide continuous electrical power to the red light at radiation levels just below maximum permissible exposure and greater.

Unique keys for the storage vault door and alarm system will be provided to employees when access to the storage vault is necessary and shall otherwise be kept in a secure location under strict supervision.

13.12 RESPIRATORY PROTECTIVE EQUIPMENT

Scott Air Pack and compressed air cylinders with Scott Mask are available to be used, as necessary, when working with radioactive gases and emergency uses.

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WASTE DISPOSAL

14.1 CONTAMINATED CLOTHING

All Radioactive Gas Technicians shall be provided with disposable protective clothing in the form of coveralls, rubber gloves, and boots. These garments will be worn as necessary while working within the radioactive materials facility. These garments shall be worn for a period not exceeding five (5) working days and shall then be placed in a container supplied by a commercial disposal service, licensed for radioactive material disposal for final disposition.

14.2 CONTAMINATED MATERIALS

All paper towels and other similar materials, as well as scrap paper and order sheets used within the radioactive gas filling facility, shall be disposed of by a commercial disposal service licensed for radioactive material disposal.

14.3 WASTE WATER

All waste water from sinks, drainage trench and floor drains shall be collected in a storage tank. Prior to release to the sanitary sewage system, the radioactive material level shall be determined to assure compliance with 10 C.F.R. 20.303. Should the level of radioactive material exceed those levels prescribed in 10 C.F.R. 20.303, the contaminated water shall be disposed of by a commercial disposal service licensed for radioactive material disposal.

14.4 RADIOACTIVE MATERIAL WASTES

Present transfer techniques for radioactive gases require no waste disposal methods. Should such need arise, waste materials shall be disposed of by a commercial disposal service licensed for disposal of radioactive materials or by methods prescribed by 10 C.F.R. 20.301.

14.5 COMMERCIAL WASTE DISPOSAL SERVICE

The current commercial service utilized is:

Radiac Research Corporation
261 Kent Avenue
Brooklyn, New York 11211

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RADIATION PROTECTION PROGRAM

15.1 RADIATION SAFETY POLICY

Protection against unnecessary exposure to radiation by employees is a primary concern of the management of Airco Rare and Specialty Gases. Completion of assigned work is, of course, important but under all circumstances, safety is the paramount concern.

Implementation of programs to keep exposures to radiation as low as is reasonably achievable is the responsibility of the supervisory staff but of equal importance is the employee's commitment to safe operations and low exposures.

It is the responsibility of the supervisory staff to monitor operations and fully establish the safety of the operations. It is the responsibility of the Assistant Operations Manager and Radiation Safety Officer to implement programs designed to reduce exposures of individual employees to radiation and to determine that the gas filling operations meet the safety requirements of the Nuclear Regulatory Commission.

Further, it is the responsibility of those supervisors to ensure that the radiation protection program as outlined in our Nuclear Regulatory Commission license is enforced. This program includes a commitment to adequate training to employees as well as operational instrumentation and personal protective devices. The program also requires quarterly audits of

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operations and constant review of procedures in order that the philosophy of "as low as is reasonably achievable exposure to radiation" is a functional philosophy.

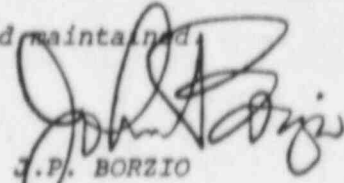
It is also my responsibility and that of the other supervisors of the Rare and Specialty Gas Department to see that all recommendations by employees are thoroughly reviewed and formally acted upon.

The Company has provided the employees with the training, instrumentation and protective devices necessary to determine and reduce the level of radiation exposure received during gas filling operations. It is important that employees fully utilize these in order to satisfy themselves and reviewers of our procedures that operations are, in fact, safe. If the safety of any operation is in question, then it is your responsibility as an employee to advise the Radiation Safety Officer of the questionable aspects of the operation.

It is your right to question decisions of supervisors if there is doubt concerning your personal safety. No employee will be required to perform and operation without first being convinced of its safety.

It is only through the joint efforts of supervisors and you, the employee, that a safe working environment can be assured and maintained.

cc: F.J. Dux, Murray Hill
D.R. Wilson, Murray Hill
W.H. Hans, Murray Hill
R.E. Eberly, Riverton
J.L. Weber, Riverton


J.P. BORZIO
Operations Manager

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15.2 TRAINING OF NEW EMPLOYEES

A. New employees:

Prior to undertaking filling operations, all new Radioactive Gas Technicians shall attend a seminar in which the following topics will be addressed:

Basic principles of radiation.

Unit of activity and exposure.

Biological effects of ionizing radiation.

Basic principles of radiation protection.

N.R.C. regulations, 10 C.F.R. 19 and 20.

Department of Transportation Regulations, Sections 173.389 through 173.909, as applicable.

The operation of available radiation detection instrumentation.

Emergency procedures.

B. Periodic review:

At intervals not to exceed six months, a seminar as described in 15.2A shall be presented to all Radioactive Gas Technicians. Emphasis will be on continued understanding and application of relevant safety procedures.

C. Training by an outside agency:

At intervals not to exceed three years, training as prescribed in 15.2A or similar will be prescribed by our outside consulting firm or institution of recognized standing in the field of radiation safety. Emphasis will be on updating knowledge of employees.

15.3 MEDICAL EVALUATION

A medical examination shall be provided to each Radioactive Gas Technician at intervals not to exceed one year.

15.4 PERIODIC AUDIT

The "Individual Users" and Radiation Protection Officer listed in Items 6

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and 7 of this application and outside Radiological Consultant shall conduct a complete audit of radioactive gas filling operations at intervals not exceeding three months. Information to be reviewed shall include:

- A. Exposure records - film badge reports and urine bioassays.
- B. Radiation level survey logs.
- C. Operating procedures.
- D. Consultation with workers.

Upon completion of review, those persons listed in Items 6 and 7 of the application and outside Radiological Consultant shall propose how best to reduce exposures of individual workers. Those proposals shall be documented and acted upon as soon as possible.

15.5 RADIATION SURVEYS

In addition to those surveys noted in Item 12 of this application, the following surveys shall also be performed:

- A. Twice daily, all monitoring instrumentation shall be checked for operation and the radiation level determined and recorded.
- B. At intervals not to exceed one week, a survey shall be conducted with a suitable portable survey meter to determine radiation levels. These measurements will be logged. The points of monitoring shall be as indicated on Portable Survey Diagrams A and B.
- C. At intervals not to exceed one month, smears of the facility as indicated on Swipe Test Diagram will be taken to monitor for contamination.

15.6 RADIATION SAFETY OFFICER (R.S.O.)

A. Qualifications:

The R.S.O. must be familiar with the operations of a radioactive gas filling facility. He must have the supervisory capability to direct the work of employees required to implement the radiation protection program. He must have a Bachelor's Degree in Engineering or a science and also have training in radiation protection conducted by an outside

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consulting firm or institution recognized standing in the field of radiation safety.

B. Responsibilities:

- 1) Reports - It shall be the responsibility of the R.S.O. to maintain all film badge and bioassay reports noting any unusual exposures or trends of changes in exposures and report these results and recommendations to the individuals in Item 6 of this application.
- 2) Training - It shall be the responsibility of the R.S.O. to provide the training outlined in Section 15.2 of this program.
- 3) Periodic Audit - It shall be the responsibility of the R.S.O. to participate in the quarterly audit as outlined in Section 15.5 of this program.
- 4) Radiation Surveys - It shall be the responsibility of the R.S.O. to conduct or supervise the surveys outlined in Section 15.5 of this program.
- 5) Incident Reports - It shall be the responsibility of the R.S.O. to fully investigate any unusual exposures to individuals, accidental releases of radioactive gas or excessive survey reports and communicate the results of this investigation to the individuals listed in Item 6 of this application. The R.S.O. will also recommend any changes in operating procedure necessary to prevent a re-occurrence of the incident and make appropriate changes in the radiation protection program.
- 6) Modification of Operating Procedure - The R.S.O. shall continually review operating procedures and note any changes which might help reduce exposure to employees and communicate these recommendations to the individuals listed in Item 6 of this application.
- 7) Instrumentation - The R.S.O. will be responsible for ensuring that proper equipment and supplies are available to evaluate exposures. The R.S.O. shall be responsible for the periodic calibration of instrumentation.

SUPPLEMENTAL SHEET ITEM 15 (PAGE 6)

AMENDMENT NO. 34

N.R.C. LICENSE NO. 29-02085-01

C. AUTHORITY:

The R.S.O. shall have authority over all operations involving radioactive materials. His authority shall extend to the supervision of operations, if necessary, to insure the safety of concerned personnel.

SUPPLEMENTAL SHEET ITEMS 16 AND 17 (PAGE 1)

AMENDMENT NO. 34

N.R.C. LICENSE NO. 29-02085-01

RADIOISOTOPE TRAINING AND EXPERIENCE

Name John P. Borzio-Operations Mgr.

Department Rare & Specialty Gases

Date April 15 & 18, 1980

TYPE OF TRAINING

WHERE TRAINED

DURATION OF
TRAINING

ON THE JOB
(Circle Answer)

FORMAL COURSE
(Circle Answer)

Principles & practices of
radiation protection * * * *

a. Airco	1979 - Present	Yes	No	Yes	No
b. Mohammed Latif and Gerald Nicholls, PhD Outside Radiation Safety Consultants	2 Days	Yes	No	Yes	No

Radioactivity measurement
standardization & monitoring
techniques & instruments * *

a. Airco	1979 - Present	Yes	No	Yes	No
b. Mohammed Latif and Gerald Nicholls, PhD Outside Radiation Safety Consultants	2 Days	Yes	No	Yes	No

Mathematical & calculations
basic to the use of measurement
of radioactivity * * * * *

a. Airco	1979 - Present	Yes	No	Yes	No
b. Mohammed Latif and Gerald Nicholls, PhD Outside Radiation Safety Consultants	2 Days	Yes	No	Yes	No

Biological effects of
radiation * * * * *

a. Airco	1979 - Present	Yes	No	Yes	No
b. Mohammed Latif and Gerald Nicholls, PhD Outside Radiation Safety Consultants	2 Days	Yes	No	Yes	No

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

<u>ISOTOPE</u>	<u>MAXIMUM AMOUNT</u>	<u>WHERE EXPERIENCE WAS GAINED</u>	<u>DURATION OF EXPERIENCE</u>	<u>TYPE</u>
H-3	200 Curies	Airco	1979 - Present	Gas Mixing
C-14	1 Curie	Airco	1979 - Present	Gas Mixing
Kr-85	1200 Curies	Airco	1979 - Present	Gas Mixing
Xe-133	20 Curies	Airco	1979 - Present	Gas Mixing

SUPPLEMENTAL SHEET ITEMS 16 AND 17 (PAGE 1)

AMENDMENT NO. 34

N.R.C. LICENSE NO. 29-02085-01

RADIOISOTOPE TRAINING AND EXPERIENCE

Name Robert E. Eberly-Asst. Operations Mgr.

Department Rare & Specialty Gases

Date April 15 & 18, 1980

TYPE OF TRAINING

WHERE TRAINED

DURATION OF
TRAINING

ON THE JOB
(Circle Answer)

FORMAL COURSE
(Circle Answer)

Principles & practices of
radiation protection * * * *

a. Airco	1957 - Present	Yes	No	Yes	No
b. Mohammed Latif and Gerald Nicholls, PhD Outside Radiation Safety Consultants	2 Days	Yes	No	Yes	No
a. Airco	1957 - Present	Yes	No	Yes	No
b. Mohammed Latif and Gerald Nicholls, PhD Outside Radiation Safety Consultants	2 Days	Yes	No	Yes	No
a. Airco	1957 - Present	Yes	No	Yes	No
b. Mohammed Latif and Gerald Nicholls, PhD Outside Radiation Safety Consultants	2 Days	Yes	No	Yes	No
a. Airco	1957 - Present	Yes	No	Yes	No
b. Mohammed Latif and Gerald Nicholls, PhD Outside Radiation Safety Consultants	2 Days	Yes	No	Yes	No

Radioactivity measurement
standardization & monitoring
techniques & instruments * *

Mathematical & calculations
basic to the use of measurement
of radioactivity * * * * *

Biological effects of
radiation * * * * *

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

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE
H-3	200 Curies	Airco	1957 - Present	Gas
C-14	1 Curie	Airco	1957 - Present	Mixing
Kr-85	1200 Curies	Airco	1957 - Present	Gas
Xe-133	20 Curies	Airco	1957 - Present	Mixing

SUPPLEMENTAL SHEET ITEMS 16 AND 17 (PAGE 1)

AMENDMENT NO. 34

N.R.C. LICENSE NO. 29-02085-01

RADIOISOTOPE TRAINING AND EXPERIENCE

Name John L. Weber-Operations Foreman

Department Rare & Specialty Gases

Date April 15 & 18, 1980

TYPE OF TRAINING

WHERE TRAINED

DURATION OF
TRAINING

ON THE JOB
(Circle Answer)

FORMAL COURSE
(Circle Answer)

Principles & practices of
radiation protection * * * *

a. Airco	1973 - Present	Yes	No	Yes	No
b. Mohammed Latif and Gerald Nicholls, PhD Outside Radiation Safety Consultants	2 Days	Yes	No	Yes	No

Radioactivity measurement
standardization & monitoring
techniques & instruments * *

a. Airco	1973 - Present	Yes	No	Yes	No
b. Mohammed Latif and Gerald Nicholls, PhD Outside Radiation Safety Consultants	2 Days	Yes	No	Yes	No

Mathematical & calculations
basic to the use & measurement
of radioactivity * * * * *

a. Airco	1973 - Present	Yes	No	Yes	No
b. Mohammed Latif and Gerald Nicholls, PhD Outside Radiation Safety Consultants	2 Days	Yes	No	Yes	No

Biological effects of
radiation * * * * *

a. Airco	1973 - Present	Yes	No	Yes	No
b. Mohammed Latif and Gerald Nicholls, PhD Outside Radiation Safety Consultants	2 Days	Yes	No	Yes	No

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

<u>ISOTOPE</u>	<u>MAXIMUM AMOUNT</u>	<u>WHERE EXPERIENCE WAS GAINED</u>	<u>DURATION OF EXPERIENCE</u>	<u>TYPE</u>
H-3	200 Curies	Airco	1973 - Present	Gas
C-14	1 Curie	Airco	1973 - Present	Mixing
Kr-85	1200 Curies	Airco	1973 - Present	Gas
Xe-133	20 Curies	Airco	1973 - Present	Mixing
				Gas
				Mixing

SUPPLEMENTAL SHEET ITEMS 16 AND 17 (PAGE 4)

AMENDMENT NO. 34

N.R.C. LICENSE NO. 29-02085-01

Item 17 - RADIATION SAFETY OFFICER
JACK B. WERT

A. TRAINING

1979 - Radioisotope Methodology Course, 3 seminar hours, Trenton State College. Experience in all aspects of radioisotope methodology including radiation detection (i.e., G-M counting, solid scintillation, gas flow proportional counting, liquid scintillation, autoradiography), source preparation and waste disposal procedures with many of the common radioisotopes (i.e., Cs-137, Sr-90, Tl-204, C-14, H-3, Am-241, Mn-54 and Co-60).

1981 - Radiation Safety Specialist Program October 19 - 23. Presented by Oklahoma State University.

B. EDUCATION

1979 - B.A., Biology, Trenton State College, graduated Cum Laude.

C. EXPERIENCE

2/81 - Radiation Safety Officer, Airco Industrial Gases.
Present Responsible for all aspects of the radioactive gas filling facility licensed for 1200 Ci Kr-85, 200 Ci H-3, 20 Ci Xe-133 and 1 Ci C-14.

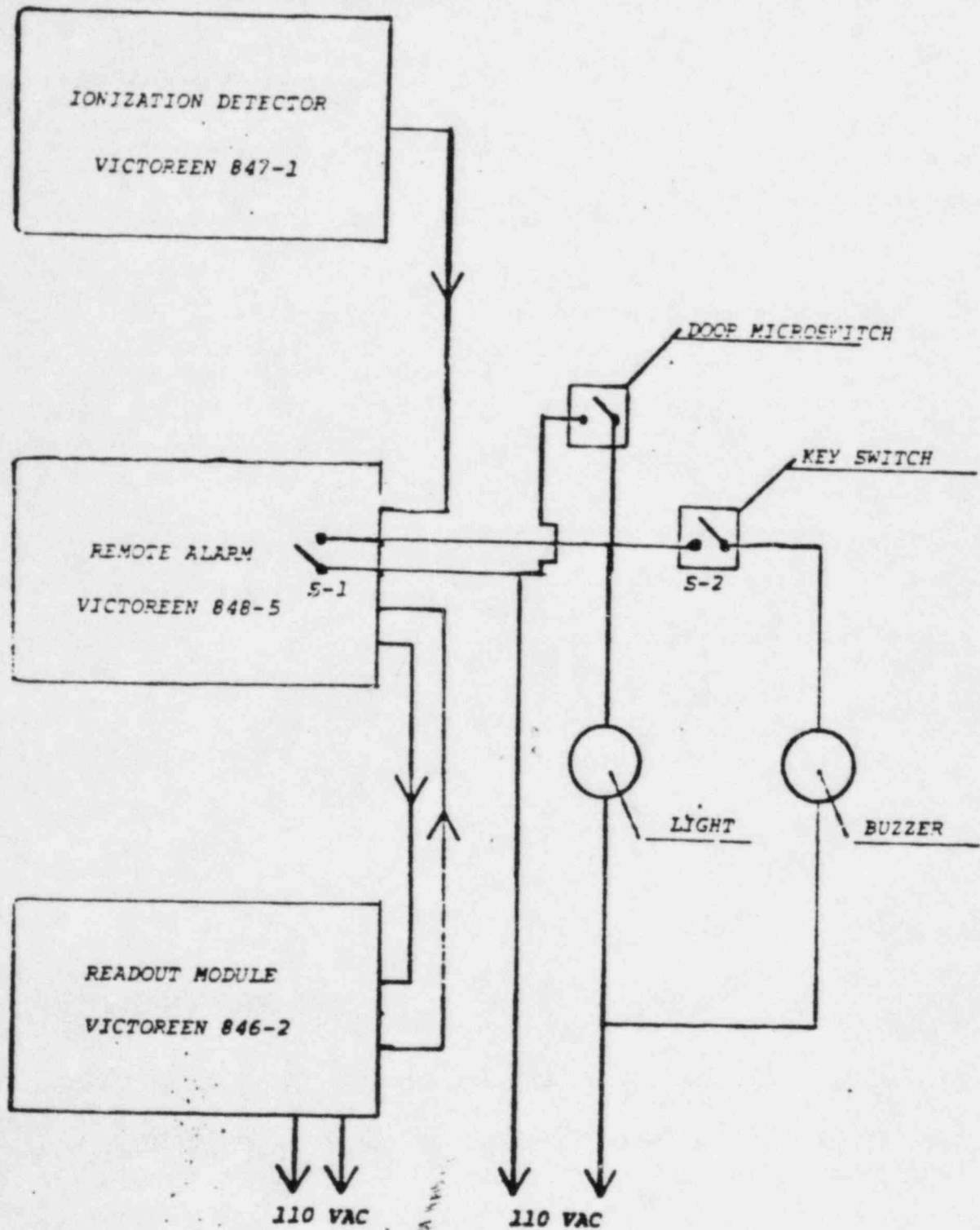
D. PROFESSIONAL AFFILIATION

Plenary member of Health Physics Society.

ALARM SYSTEM DIAGRAM

AMENDMENT NO. 34

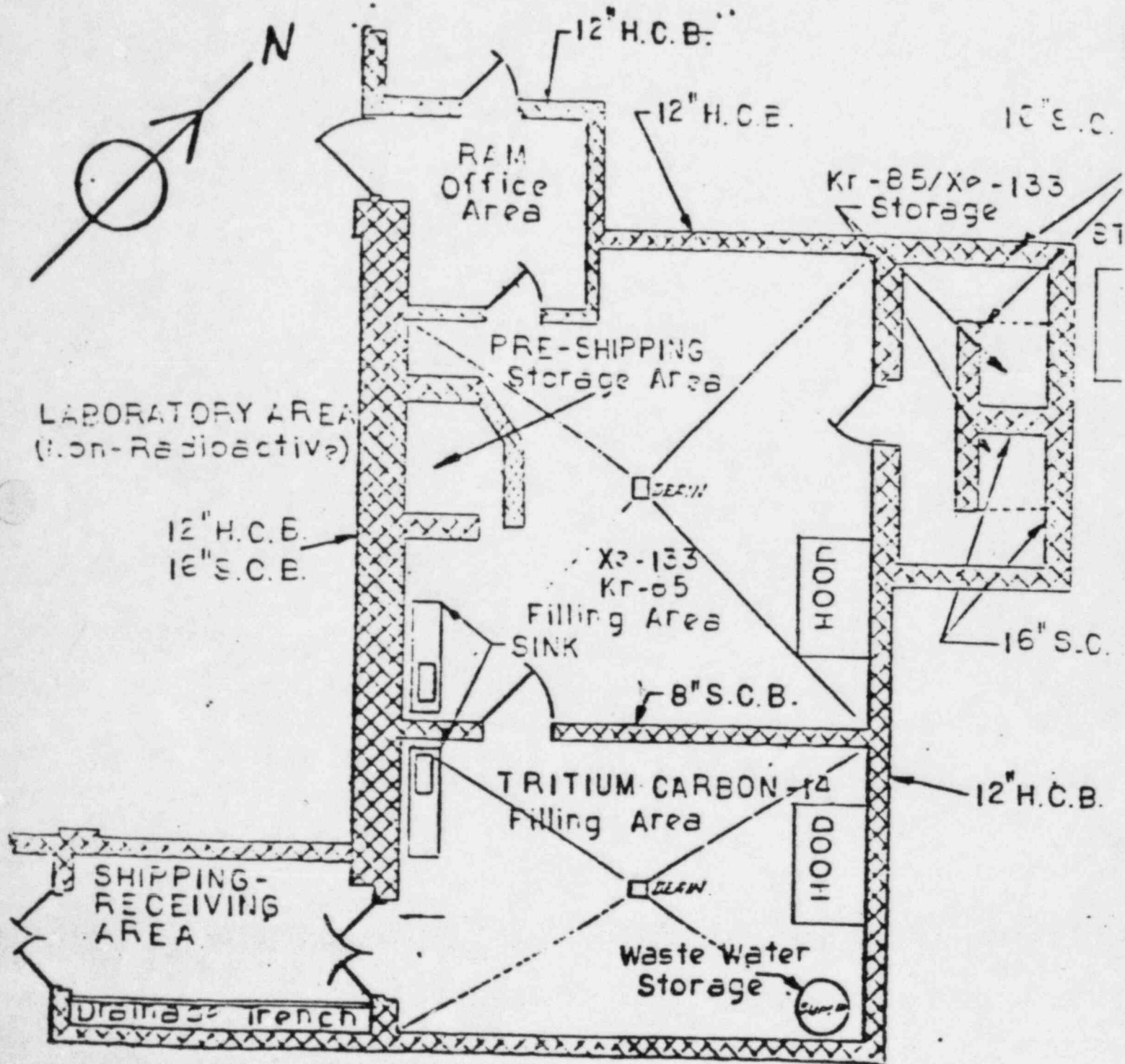
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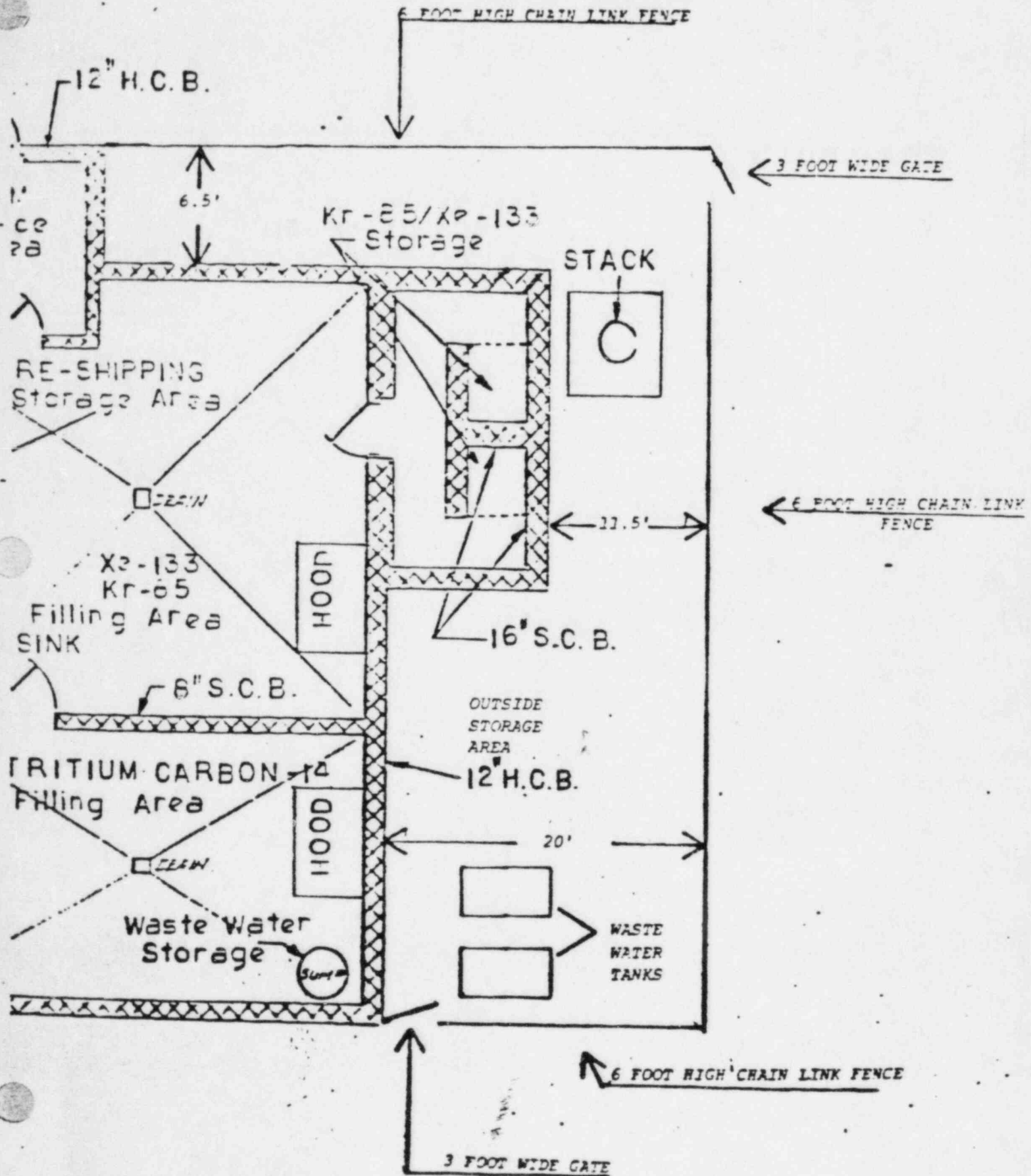


GENERAL DIAGRAM A

AMENDMENT NO. 34

N.R.C. LICENSE NO. 29-02085-01

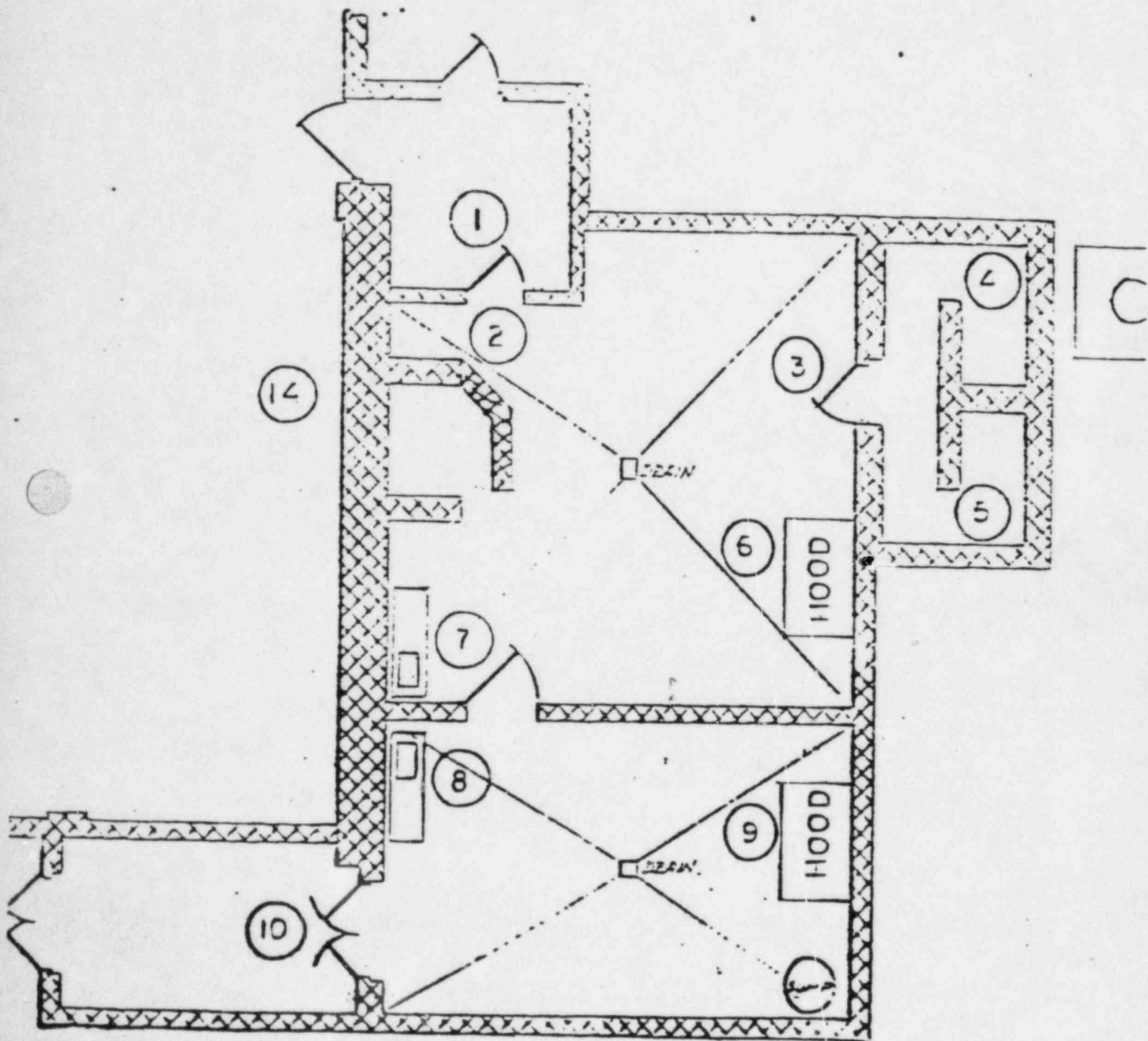




PORTABLE METEOR SURVEY DIAGRAM

AMENDMENT NO. 34

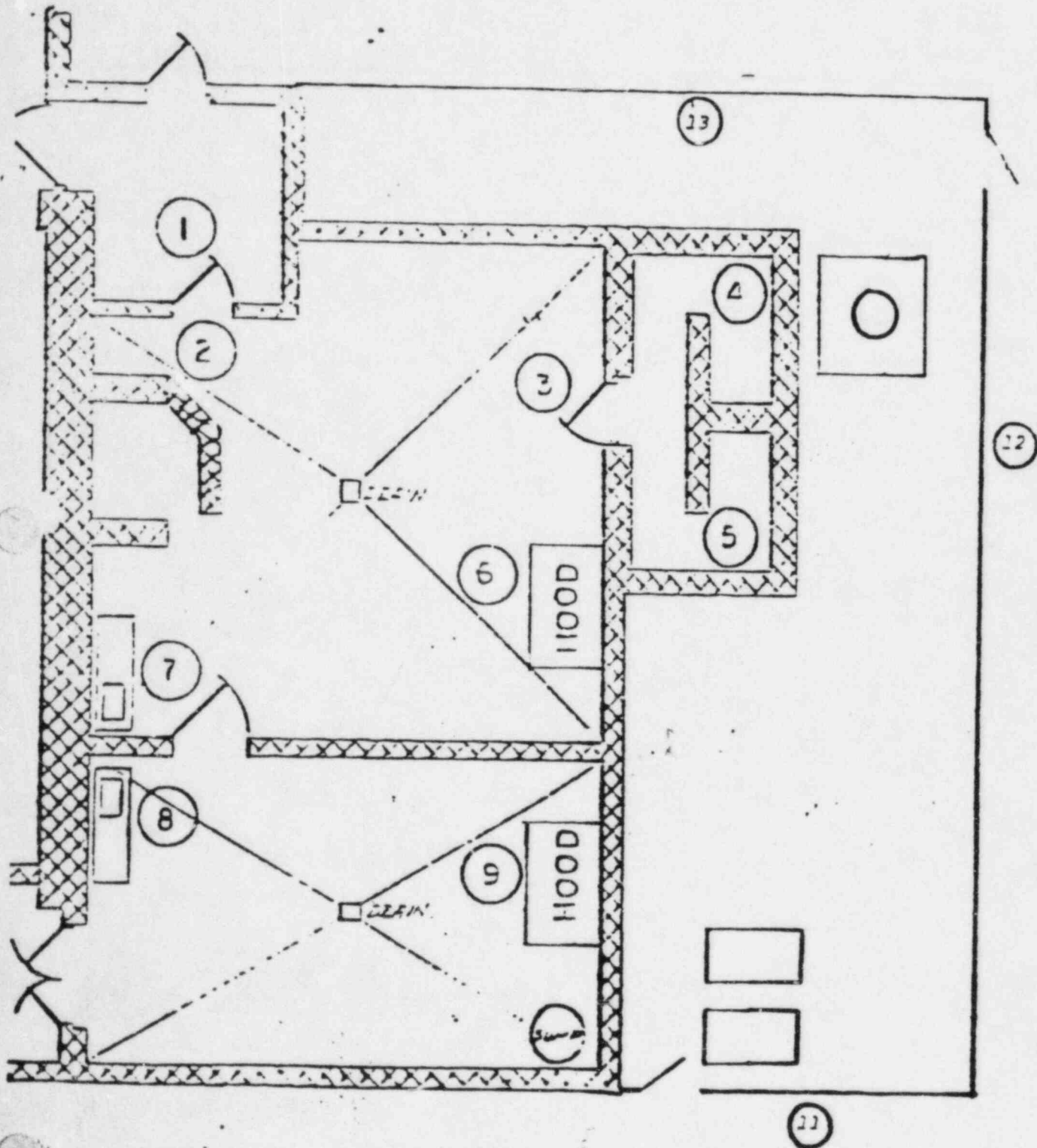
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PORTABLE SURVEY METER DIAGRAM B

AMENDMENT NO. 34

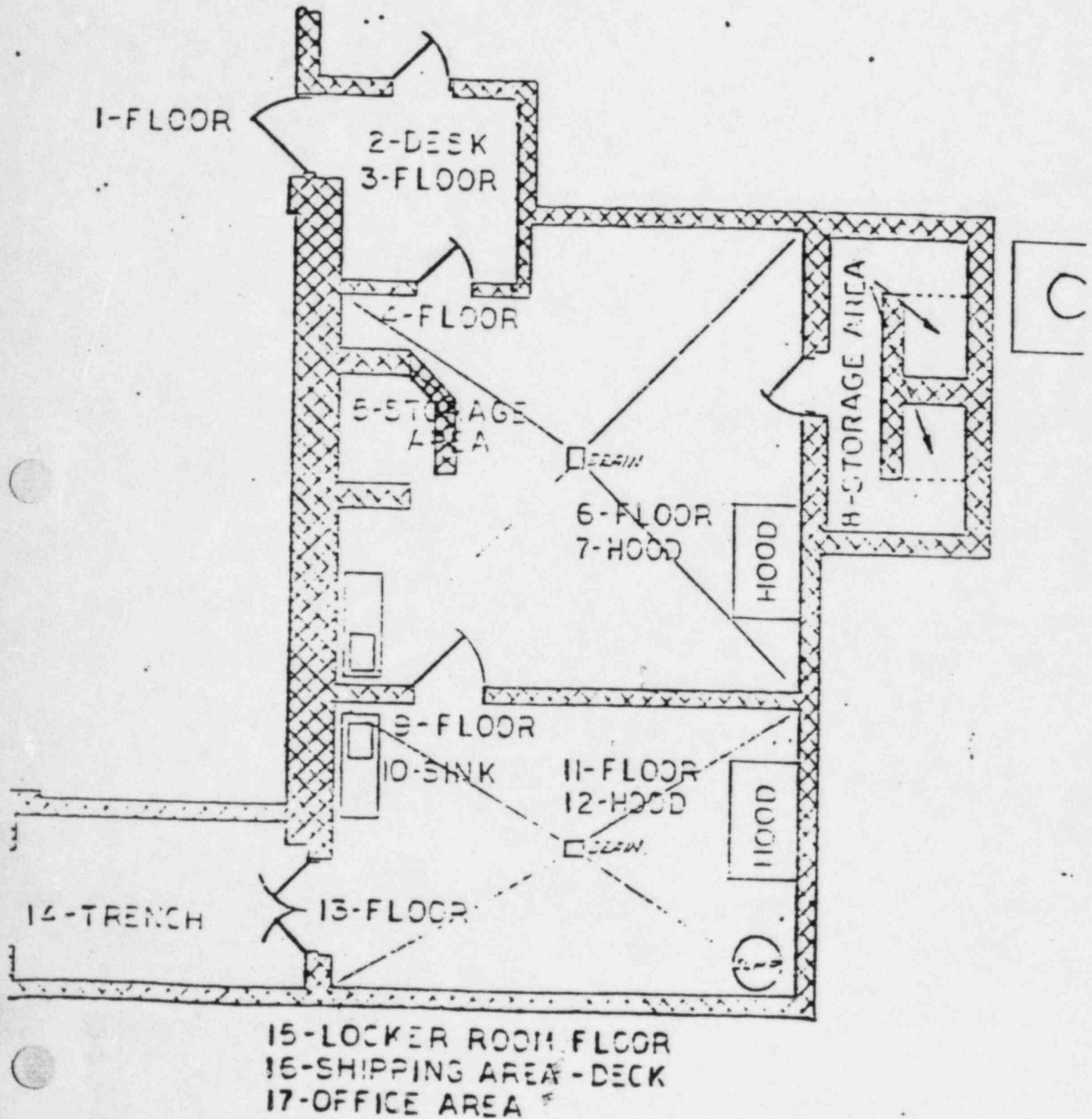
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SWIFT TEST DIAGRAM

AMENDMENT NO. 34

N.R.C. LICENSE NO. 29-02085-01



BETWEEN: William O. Miller, Chief
License Fee Management Branch
Office of Administration -

John E. Glenn, Chief
Nuclear Materials Section B
Division of Engineering and
Technical Programs

Verbal OK

LICENSE FEE TRANSMITTAL

A. REGION I

More Money
Needed

1. APPLICATION ATTACHED

Applicant/Licensee: Airco Incorporated
Application Dated: 5/20/85
Control No.: 03857
License No.: 29-02085-01

2. FEE ATTACHED

Amount: \$ 110.00
Check No.: 008111

3. COMMENTS

Will be an amt
per Jack Davis 6/19
03214

Signed Brandon Platchek
Date 5/28/85

B. LICENSE FEE MANAGEMENT BRANCH

1. Fee Category and Amount: 3B - \$110 + \$10 7/87

2. Correct Fee Paid. Application may be processed for:

Amendment ✓
Renewal _____
License _____

Signed John Glenn
Date 6/17/85

"SECTION COPY"



Industrial Gases

Division of The BOC Group, Inc.
SPECIALTY GASES AND EQUIPMENT
575 MOUNTAIN AVENUE
MURRAY HILL, N.J. 07974



Trust Company Bank

Atlanta, Georgia or
FNB Rome, Georgia

64-79
611

008111

DATE	CHECK NO.
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AFTER
90
DAYS

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ORDER OF

UNITED STATES NUCLEAR
REGULATORY COMMISSION
601 PARK AVENUE
KING OF PRUSSIA PA 19406

Lynn Hawk

⑈008111⑈ ⑆061100790⑆ 8800508668⑈