

INSPECTION NOTES

ALUMINUM CORP of AMERICA (ALCOA)
ALCOA Research Laboratories
FREETOWN ROAD
New Kensington, Pennsylvania -
37-7653-2.

Inspector E. EPSTEINApproved by RSC
5/17/62

LICENSEE: _____

Lic. No. 37-7653-2Type Inspection: (I) (RI) (Announced) (Unannounced)Date May 10, 1962

I. GENERAL INFORMATION

A. Inspection on: 10 CFR (20) (30) (31) (40) (70)

B. Persons Accompanying:

Name

Position/Organization

1. A.A. Mammarella - Ind. Hygienist, Penn. Dept. of Health.
2. _____

C. Persons Contacted: (inc. name, title, rad duties, reports to)

1. JOHN E Lewis - Research Engineer - and R.S.O.
Experience: B.S. in Chem. U of Pittsburgh. 8 yrs experience in radioactive material
2. _____
Experience: _____
3. _____
Experience: _____

For person(s) acting as RSO summarize authority: Reports to Dr. P T Stroup
PHD director of Research makes monthly reports, has oversight
& built any project which he deems a hazard

D. Radiation Safety Comm. (Yes) (No). Meetings yes Minutes yes

Members, 1. Dr. P T Stroup PHD Research Director
Position & 2. Dr. E M Foster PHD Chief Physical Chem Div
Who report to. 2. MR. JOHN E Lewis R.S.O.
3. _____

Scope & Authority of Committee: Meets as applications and proposals for use come up, authorizes use, users, and facilities, as well as approval for receipt of materials

B-2

E. Organization and Administration:

1. Summary of O&A and Program (as pertains to lic. materials)

Research Center for Alcoa. was research conducted in various projects to improve aluminum products. All work is performed in the Physical Chemistry Section headed by Dr. L M Foster P.H.D. Foster Mr R.S.O. is a member of the Physical Chem Section

2. Affiliations: None

F. Facilities & Uses of Byproduct/Source /Special Nuclear Material

1. Isotopes:

Material/Form	Lic. Limit	Qty on Hand	Qty/Assay	Supplier	Use/rate/quantity
AL ²⁶ metal		580 mc	3/7/57		In storage
AL ²⁶ powder		10 mc	58		"
Ag ¹¹⁰		0.7 mc	1-28-60		"
C ¹⁴ stearic acid		10 mc	1-15-57		"
C ¹⁴ BaCO ₃		10 mc	3-30-56		"
C ¹⁴ stalic acid		1.25 mc	7-18-61		"
C ¹⁴ CO gas		1 mc	8-25-61		"
C ¹⁴ CO gas		.5 mc	3-15-62		"
C ¹⁴ CO ₂ gas		0.5 mc	2-15-62		"

2. Persons using Material(s): (inc.: name, title, duties, training, experience)

(a) Same as above.

(b) R A Kramer P.H.D. in Analytical Chem. at Pensacola. approved by Isotopes committee.

(c) R.C. Keesler }
 Thomas L Jack } all technicians working directly under
 W.W. Hill }
 John. Margenau } Keesler's personal supervision

F. 3. Facilities:

Licensee uses: () Lab () Counting room () Fume hood () Dry box
() Table/bench () remote hand. equip. () protective clothing
() other _____

Describe checked items: see attached sheets. room 604 storage facility
changed since last inspection. lead cover of ore pit.
pit lined with 2" steel

608 Train Room.

600 Photography room.

see attached sketch sheets

13.5 mc SR⁹⁰ beta thickness gage in al-foil mill

see back of this page

4. Restricted Area Established _____ Describe _____

all areas of use and storage

5. Summary of Handling Procedures/Operations:

remote control handling

6. Instrumentation & Calibration Procedures:

Juno SR-7

Jordan Alpha Beta Gamma - 0-500 R.

Model 2012 Machine of Chicago Co M 0-20 mcp/hr.

Atomic Accessories TSM-1 Train Monitor.

Various Scales and Counters

Calibrated at 6 month intervals against calibration sources.

4 H 5 mg Ra sources.

7. Other Notes: for radiographer occupancy factors, exposure times, time spent in high radiation area

G. Radiation Safety Precautions & Procedures (Summary of Scope)

1. Instructions, oral & written Radiation Protection Procedures Alcoa Research Lab. issued to all users. Posted on bulletin board of Fil Mill. Oral lectures by Lewis to employees of Fil Mill 1 hr. explaining hazards and Federal Regulations.

Licensee not complying with written procedures as follows:

full compliance case in accordance with applications dtd 3/14/60 and 3/19/62 and letter dtd 4/21/58.

2. Surveys (working areas, storage facilities, etc.) (records & dates)

- (a) Direct reading - restricted areas Yes April 1, 1962.
all areas of use and storage
monthly surveys entered in bound book

unrestricted areas yes as above

(b) Smear samples: (rest. & unrest. areas) yes
of living room and storage area.
recorded show 1×10^{-6} uc/100 cm². Co⁶⁰

(c) Air samples: (rest. & unrest. areas) yes
uses TSM- Tritium Air Monitor Monitor was in
operation in Tritium hood registered 6 uCi/m³ or 6×10^{-6} uc/ml
inside reduced hood outside registered background

3. Locking/securing of areas: all rooms locked

H. Procurement Procedures & Control

1. Person ordering/responsible & method: Lewis after approval by
the Isotopes Committee
2. Person insuring limits not exceeded: Lewis
3. Supplier: O.R. or BNL
4. Summary of procurement & receipt method: (records) Records maintained
of all receipt of materials showing dates and amounts.
5. () Preassayed: no
 () Sterilized: no
 () Leak Tested: yes Sr⁹⁰ sealed source at 6 month intervals
by Lewis according to stated procedures. kept surface with
filter paper counts swept in beta sensitive counter
using Sr⁹⁰ std calibration source was generally
within

I. Storage & Security of Material

(Un) restricted Area (Un) locked space Summary: Room 604 is totally for storage.

(a) storage box in the rear of this room is 4' x 12' and 6 feet deep.
The box has had added shield since the last inspection to reduce
the radiation level at the floor below where female secretaries are
located

J. Waste Disposal (method & quantities involved, records & dates)

1. ~~Sanitary sewer~~ 11 hours intermittent

the line is released to the sewer

None

5 ac daily 5 days a week = 25 ac/week

7300 Mc yearly

$750 \text{ cfm} \times 60 \text{ m}^3/\text{hr} \times 24 \text{ hr/day} \times 365 \text{ days/yr} \times 2.8320 \frac{\text{ml}}{\text{ft}^3}$

2. ~~Burial~~ None = $1.16 \times 10^{-10} \frac{\text{mc}}{\text{ml air}}$

3. Transfer to O.R. date and amount recorded

4-9-61

4-15 gallon metal drums

Co⁶⁰ - 60 mc

Ir⁹⁵ - 5 mc

4. Incineration note - no further evaporations are performed all liquids are precipitated on solids contained and liquid soaked up in plastic of paper

K. (☒) Posting of Areas CRA CHRA CRM CARA

(☒) Labeling Containers () Tagging Sources N/A

(☒) AEC-3 posted & where: at all locations of storage & use

Summary: all areas posted with signs C.R.A. and C.R.H.

Interim Room C.A.R.A. as well as store signs

all containers labeled C.R.M. those in storage

have tags containing kind quantity and date of assay

L. Personnel Monitoring Program (☒) (Yes) () (No) - () AEC-4 (☒) AEC-5

1. Film Badge: supplier St John X Ray

Frequency Bi weekly

review of records: (persons & readings)

May 17 700 men for [redacted] during 3 quarters 1961

and 464 1st quarter 1962. [redacted] a technician under Senior

supervision was working with Co⁶⁰ and Sr⁹⁰

all AEC-5 with all entries completed

Film badge program for 6 person who operate the

all Soil Melt with the 23.5 mc Sr⁹⁰ beta gauge

started on April 23, 1962 results not yet available

dummy badges placed in operation position shows no radiation of 0.8 mrem/hr.

2. Wrist badge: supplier no Frequency _____

Records: _____

3. Dosimeters: Supplier: _____ Read by: _____

Records (persons & readings) _____

4. Surveys: () Bioassay () Breath Anal. () other

Describe: no _____

5. Further information on AEC-4, -5, other related to personnel program: _____

AEC CONTRACTS (): no _____

M. For Radiographers:

1. Leak tests: (31.105)

(a) performed by: 2/1 _____

(b) persons lic. to perform: _____

(c) description of method: _____

N/A

2. Instrument & Calibration Procedures (31.104)

3. Quarterly Inventory (31.106)

4. Utilization Logs: description - identity - site (31.107)

5. Securing of sources & container records (31.303)

6. Dosimeter & film badge records (31.203)

7. License Conditions:

8. Per 31.102, 103 - Devices/containers properly locked & stored.

9. Status & compliance with operating & emergency procedures (31.202)

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10. Per 31.201 Limitations on radiographers & assistant rad. followed.

11. Security and surveillance during rad. operations (31.301)

N/A

12. Radiation levels on devices & containers (31.101) - (inspectors survey readings)

N/A

Note: Describe noncompliance items on back & reference applicable section of Part I.

II. Compliance with 10 CFR

A. 10 CFR 20:

<u>N/C</u>	<u>OK</u>	<u>NA</u>	<u>Paragraph</u>	<u>Topic</u>
---	✓	---	101(a)	Exposure limits in Restr. Area
---	---	✓	101(b)	Exposure exceptions - AEC-4
---	---	✓	102(b)	Determ. Acc. Dose & AEC-4
---	---	✓	102(c)	Records & Prep. of AEC-4
---	✓	---	103	Exp. to Conc. in Restr. Area
---	---	✓	104(a)(b)	Exposure of Minors - Material/Airborne
---	---	---	105(a)(b)	Levels in Unrestricted Areas - Except 2 mr/hr, 100 mr
---	✓	---	106	Effluents in Unrestricted Areas
---	✓	✓	108	Orders Requiring Bioassays
---	✓	---	201(b)	Surveys - 201(a) describes
---	✓	---	202(a)	Personnel Monitoring Requirements
---	✓	---	203(b)	Posting Rad. Areas w/CRA
---	✓	---	203(c)	" High Rad. Areas w/CHRA
---	✓	---	203(d)	" Airborne " w/CARA
---	✓	---	203(e)	" Require. Rooms/Areas w/CRM
---	✓	---	203(f)	Labeling Containers (ref. Append C) CRM
---	---	X	204	Lists posting exceptions - sealed/hospitals/ 8 hour limit
---	---	X	205	Exceptions for RM shipments
---	✓	---	206(a)	Instruction of Personnel in Restr. Area
---	✓	---	206(b)	Procedures, Regulations, License Available
---	✓	---	206(c)	AEC-3 posted in/near Restr. Area
---	✓	---	207	Storage Security of Licensed Material
---	✓	---	301	Gen. Waste Disposal Requirements
---	---	X	302	Methods of obtaining approval for waste disposals
---	---	✓	303(b)	Disposal to Sanit. Sewer - daily limits
---	---	✓	303(c)(d)	" " " " - monthly/yearly lim.
---	---	✓	304	" by burial - limits in (a)(b)(c)
---	---	✓	305	" incineration - must be licensed
---	✓	---	401(a)	Records - AEC-5 for persons req. per 202
---	---	---	401(b)	Survey records per 20.201(b)
---	---	✓	401(b)	Disposal records per 302, 303, or 304
---	---	✓	402	Reports of theft or loss
---	---	✓	403(a)(b)	Notification of incidents (a) (b)
---	---	✓	404	Report to former employees of exposure
---	---	✓	405	Report of overexposure/excessive levels
---	---	✓	406	Employees request for annual exposure

B. 10 CFR 30

<u>N/C</u>	<u>OK</u>	<u>NA</u>	<u>Paragraph</u>	<u>Topic</u>
---	---	✓	3	License requirements - use as lic. stipulates
---	---	✓	9	Exempt Concentrations per 30.73
---	---	✓	23	Reg. for issuance of specific lic. - general
---	---	✓	24	Reg. " " " " " - specific
---	---	✓	41(a)	i.e., human use by inst. & phys, radiographers etc.
---	---	✓		Records - receipt, transfer, export, disposal

C. License Conditions: (refer by no.)

11	---	✓	78 OK
12	---	✓	79 OK
13	---	✓	16 deleted
14	---	✓	
15	---	✓	
17	---	✓	

D. Previous N/C, status, & discussed with:

Dr. Foster

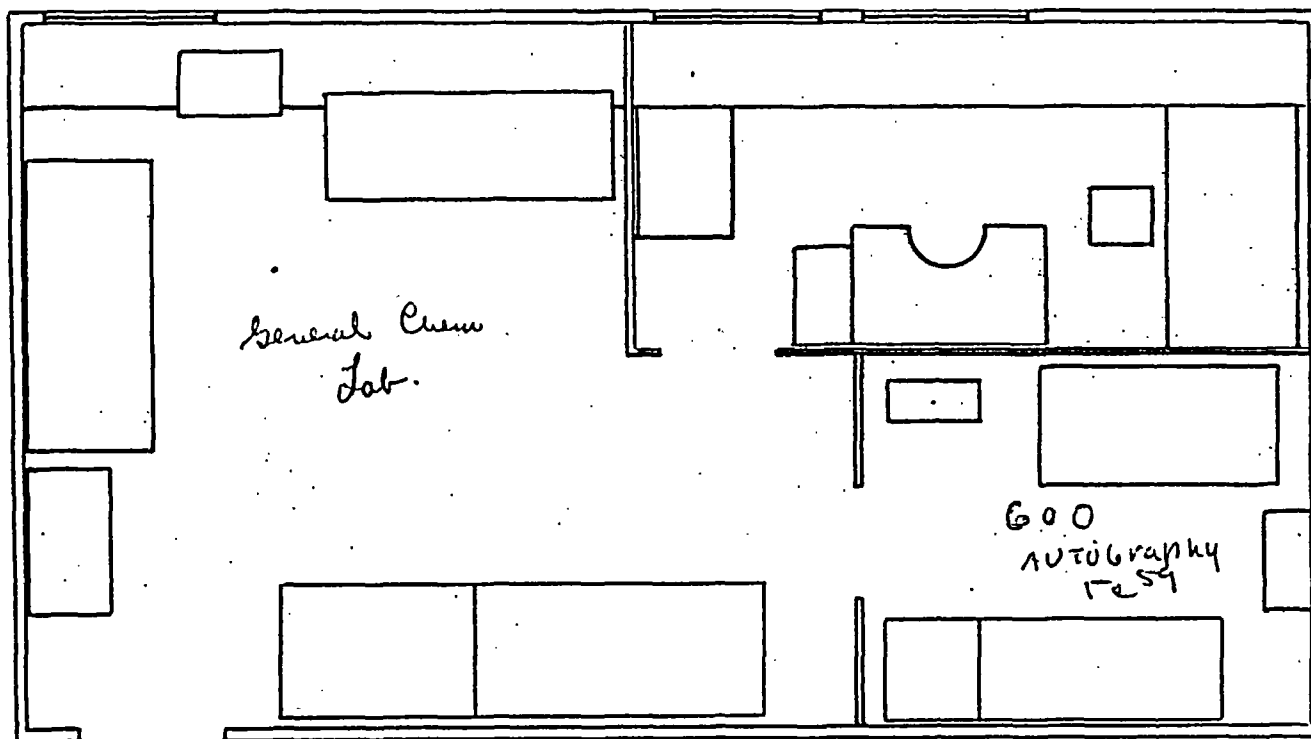
N/C item noted on previous inspection all corrected.

- 1 excessive radiation in floor below storage area
- 2 Corrected by additional shielding in storage bay.
- 3 Surveys made below bay.
- 3 Surveys were made of Beta gauge with survey badges and newly procured.
- 4 Two ionization chamber.
- 4 High radiation area no longer exists in storage room due to shielding
- 5 Records of surveys were maintained

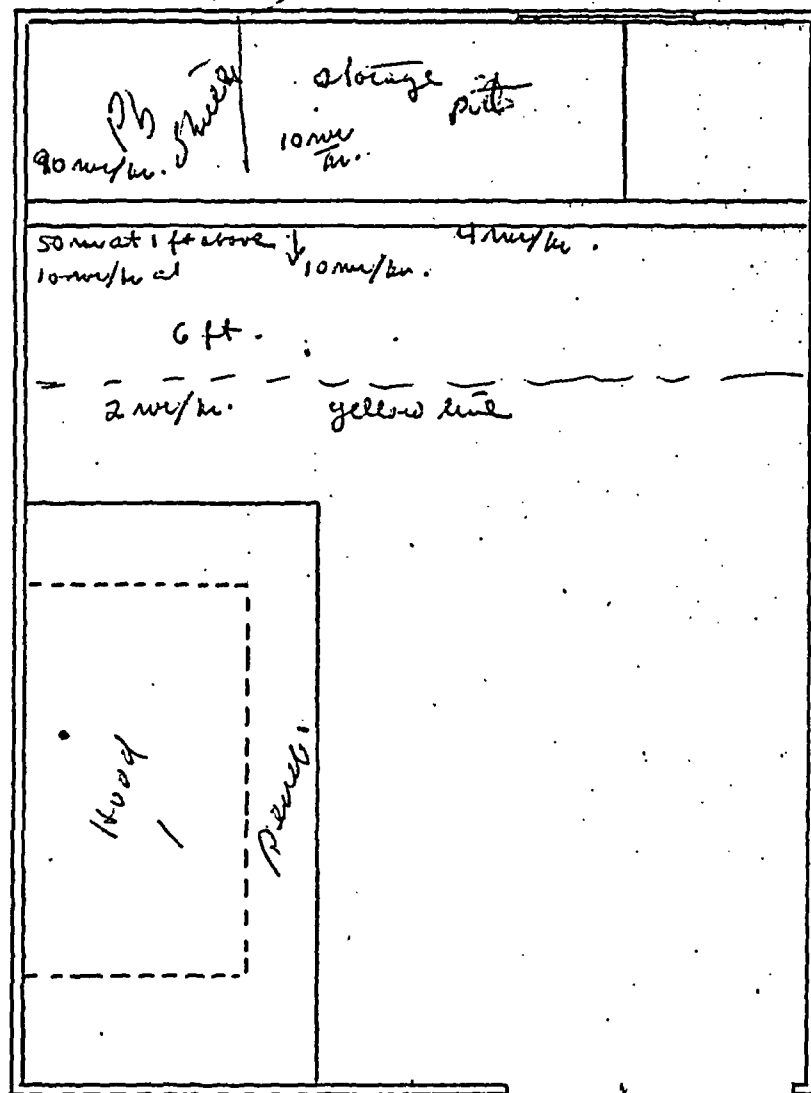
E. 10 CFR 31 - Radiographic operations

---	---	---	101	Limit of rad. level for devices & containers
---	---	---	102	Locking requirements for " " "
---	---	---	103	Storage precautions
---	---	---	104	Instruments, calibration & calib. record
---	---	---	105(a)	Auth. personnel handle etc. sealed source
---	---	---	105(b)	Leak test - 6 mo. interval
---	---	---	105(c)	Detectable level .005 uc - record of tests
---	---	---	105(d)	Level greater than .005 uc - withdraw & report
---	---	---	105(e)	Tag for loose sealed source (i.e. not in/fastene
---	---	---	106	Quarterly Inventory
---	---	---	107	Utilization Logs (description/person/site)
---	---	---	201(a)	Qualifications for radiographer
---	---	---	201(b)	" " asst. radiographer
---	---	---	202	Licensees operating & emergency procedures
---	---	---	203(a)	Film badge & dosimeter requirements for rad.
---	---	---	203(b)	Badge & dosimeter records
---	---	---	301	Security of high rad. areas
---	---	---	302	Posting radiographic areas
---	---	---	303(a)	Calibrated & Operable instr. at exposure site
---	---	---	303(b)	Survey of device after each exposure
---	---	---	303(c)	Survey when securing device & also container
---	---	---	303(d)	Records of surveys conducted per 303(c)

Note: Explain L&R's meaning of an adequate instrument calibration procedure. Check sources not adequate.



photograph building

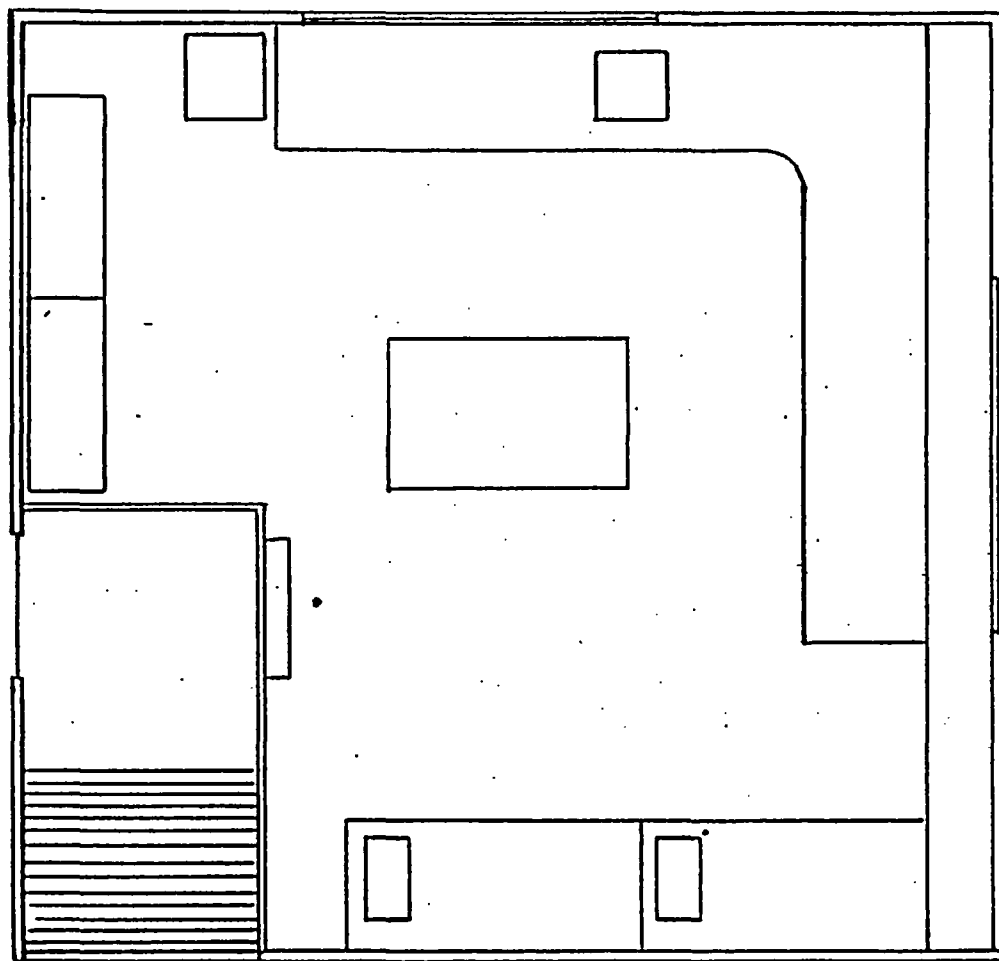


604

Now below

0.05 m²/hr.

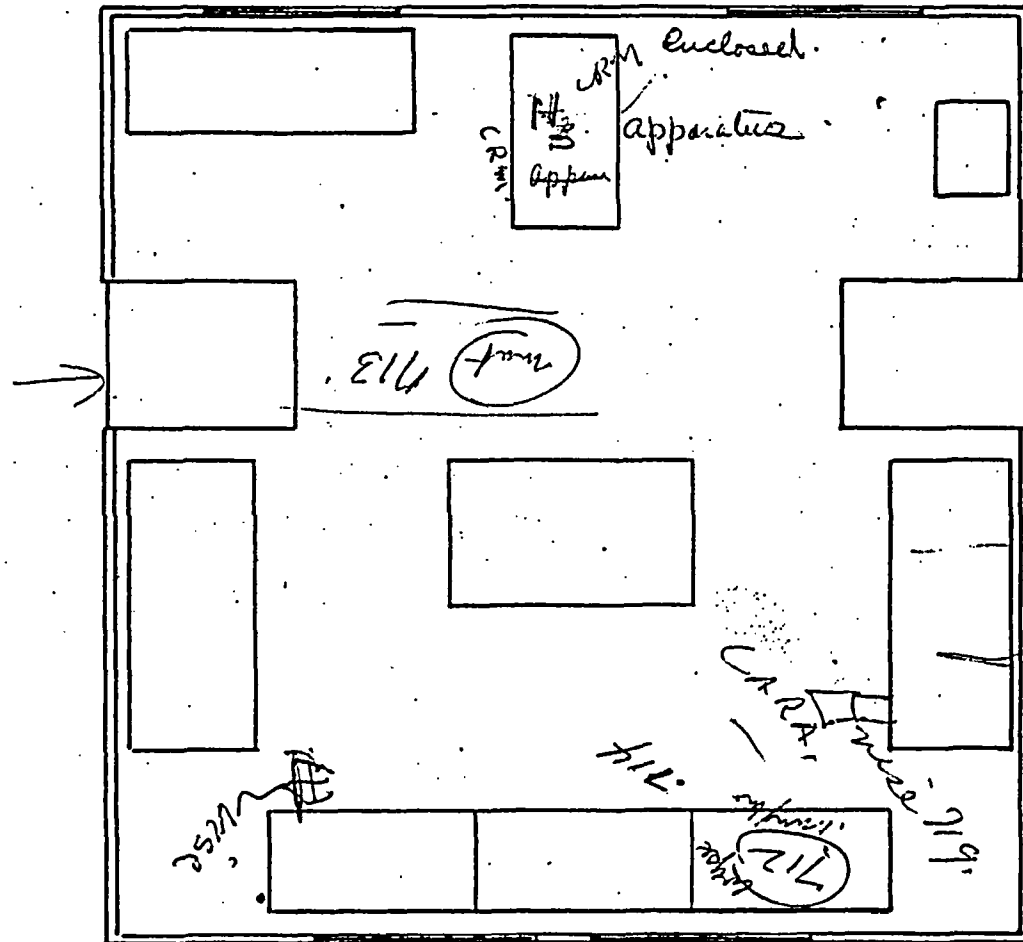
3 ft²/hr.



606

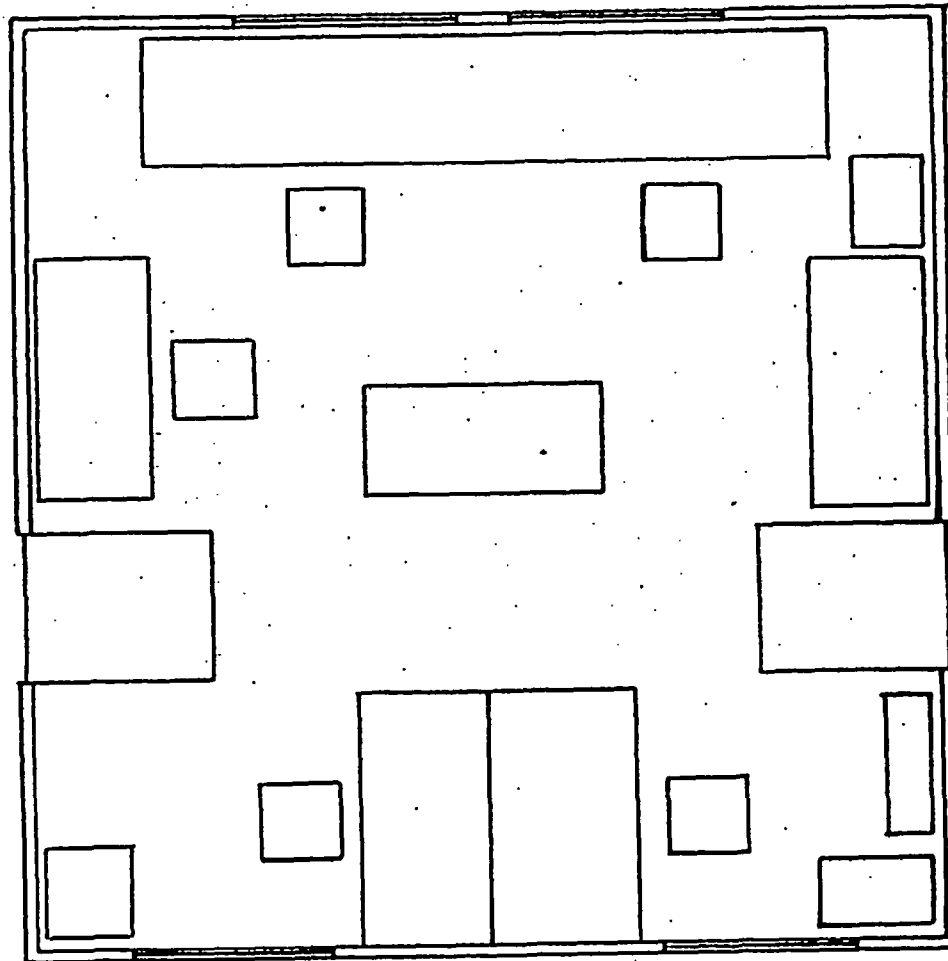
Chem lab :

2112



608

Countriy Room.



614 Countriy Room

RADIATION PROTECTION PROCEDURES
Alcoa Research Laboratories

1. The Radiological Safety Officer, Mr. John E. Lewis, is ultimately responsible for all radiological safety of these Laboratories. All new procedures, particularly when there is even a remote danger of ingestion or inhalation of radioactive material, should be cleared with the Radiological Safety Officer. The Radiological Safety Officer will advise where special protective apparel, such as inhalators or gloves, are required. The extent of shielding and safe working distances proposed in a given project should be approved by the Radiological Safety Officer.

2. Survey and Monitoring Procedures

- A. Isotope Shipments

All incoming shipments should be surveyed to ascertain the safe working conditions before and after removal from shipping containers and during the working period as required.

- B. Personnel Monitoring

Dosimeter pens and film badges are to be worn by all personnel. Accurate records of dosimeter pen readings must be kept, and cumulative weekly exposure should not exceed 300 milliroentgens (mr). Film badges are to be replaced bi-weekly unless otherwise indicated.

3. Work Area and Personal Cleanliness

General good housekeeping is mandatory in all radio-chemical work. Work area should be free from equipment not required for the current experimental program.

- A. Chemical Work

Fume hoods, absorbent cloth, rubber gloves, laboratory coats, and other safeguards are to be employed as determined by consultation with the Radiological Safety Officer.

- B. Non-Chemical

It is important to be aware of chemical reactions, mechanical operations, or other phenomena which might put radioactive material out of control.

4. Location of Work

All hazardous operations with radioactive isotopes are to be carried out in the radioactive tracer laboratories, using its special equipment as required.

5. Internal Radiation Hazards

A. Ingestion

Ingestion of active material is exceedingly dangerous. It should be avoided at all costs. If accidental ingestion is suspected, inform the Radiological Safety Officer of full particulars and consult the Laboratory physician for remedial measures.

Note: Ingestion may take place by transfer of active material from work surfaces, containers, etc., to hands, cigarettes, clothing, food, or any material which you normally handle. On this basis, it is necessary to prohibit smoking, drinking, or eating in a vicinity which may be contaminated with radioactive material.

B. Inhalation

This hazard is as serious and as difficult to detect as ingestion. Use adequate ventilation and forced drafts where necessary to prevent active gases, dust, or fumes from being inhaled. Where a dangerous inhalation is suspected, contact the Radiological Safety Officer and the Laboratory physician.

6. Procedure in Case of Radioactive Spill

- A. Notify the Radiological Safety Officer.
- B. Stay out of the area, prevent other traffic through the area, do not spread the contamination.
- C. All further action concerning the spill is to be supervised and directed by the Radiological Safety Officer.

7. External Radiation Accident

Report to the Radiological Safety Officer when an external radiation accident has occurred. For purposes of this discussion, a radiation accident will include any dosage within one week in excess of 300 milliroentgens. Avoid any further exposure to the radioactive source until qualified clearance has been obtained.

8. Storage and Transport of Radioactive Materials

A. Long-Term Storage

In locked radioactive storage rooms, only.

B. Short-Term Storage

In locked room unless completely impracticable. If

storage in locked room is not practicable, material must be properly labeled and shielded so as not to present a radiation hazards.

C. Transport

All transfer and moving of radioactive materials must be done in shielded containers as required. The responsible person must be especially careful to anticipate hazards which might result from spilling, breakage, or decomposition.

9. Disposal of Radioactive Isotopes

All radioactive material, including anything which may have been contaminated, must be monitored before disposal and if found active must be placed in marked and covered disposal containers to be shipped to Oak Ridge National Laboratory. Questionable materials are to be referred to the Radiological Safety Officer. Liquid wastes are to be concentrated by evaporation and/or solidified with plaster of Paris. The Radiological Safety Officer should be consulted before discharging radioactive gases or fumes into the atmosphere or radioactive materials into the public sewer system.