

BACKUP - CLEAR 591 (all 3 Licenses)

INSPECTION NOTES

Inspector F. Brandkamp
Approved by 10/2/63 *[Signature]*

LICENSEE: NATIONAL RESEARCH CORPORATION Lic. No. 20-1465-4, -5, -6
Type Inspection: (I) (RI) (Announced) (Unannounced)
-4, -5 -6 Date 9/27/63

I. GENERAL INFORMATION *(-6 suspended -3)*

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

B. Persons Accompanying:

Name	Position/Organization
1. None - State Notified	
2.	

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

1. Dr. Wayne Keller, RSO (-5 & -6)
Experience: Administrator, Uranium Processing Program, 1942-1952
Nat. Research Corp. 1952 to date

2. J. R. Roehrig, ^{(-4) (-6) near; RSO (-4)} on-job training with radium
Experience: Kr-85 and H-3 since 1951. No formal courses *-4, -6*

3. _____
Experience: _____

For person(s) acting as RSO summarize authority: Keller, RSO, (-5, -6) fully
responsible for all activities; S. Levin, MIT Health Physicist, perform
all surveys and reports to Keller. J. R. Roehrig, RSO for Lic -4,
responsible for safeguarding and supervision of use of unit
containing sealed Kr-85 sources.

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

Members, 1. _____
Position & Who report 2. _____
to. _____
3. _____

Scope & Authority of Committee _____

ITEM # 8

A/R *Mais Heblman* *(6)*

E. Organization and Administration:

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

Nat. Research at Cambridge is primarily a research and development organization; became a subsidiary of Norton Co., Worcester, about three months ago. Housed in "L" shaped, four story building about 125' x 125'. Work with H-3 under License -6, and Kr-85 under Lic -4 discontinued. Po-210 and Sr-90 sources used in enclosure designed to simulate exposure of metals to radiation and alternating temperature changes of an orbiting satellite.

2. Affiliations: closely related to MIT research personnel

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

I. Isotopes:

License #	Material/Form	Lic. Limit	Qty on Hand	Qty/Assay	Supplier	Use/rate/quantity
-4	Kr-85	⁸⁷⁰ 320 mc	none			
-5	Sr-90	2.8 c	0.4 c			
	Po-210	210 mc	210 mc as of 2/62			
-6	H-3	400 c	none			

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

(a) Dr. Keller and Mr. Roehrig as per item 1.C for training and exp.

(b) Dr. Keller supervised Roehrig in operations using tritiated Zr and Ti foils - process described in paragraph 10 of Inspection Report dated 7/10/58.

(c) Roehrig is only person who was involved in handling Kr-85 sources as an integral part of a gas chromatography unit. Keller supervised all such operations.

F. 3. Facilities:

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

Describe checked items: Forceps, protective (lab) coats, rubber gloves
and lead impregnated rubber gloves.

4. Restricted Area Established Yes Describe Basement Room B12 is partitioned
off; north ^end contains "outer space simulator" containing sources.
Room posted CRA and device posted CRM.

5. Summary of Handling Procedures/Operations:

Window in box-like space simulator can be opened to obtain
wipes of sources within. No other handling done or necessary.

6. Instrumentation & Calibration Procedures:

Tracerlab SULA alpha Cutie Pie; Window 2-3 mg/cm², 0-2500 mr/hr
Eberline PAC 3G Gas Prop. Alpha Counter, aluminized Milar window,
0.25 mil thickness; θ - 100,000 c/min., Atomic Inst. Co Model 409
beta-gamma; 30 mg/cm² window; 0 - 20,000 cpm
calibration checked "as necessary" by S. Levin. No records kept.

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: No written instructions; little or no handling or use involved. RSO's give verbal instructions as necessary.

Licensee not complying with written procedures as follows: _____

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

(a) Direct reading - restricted areas Records on hand show dose rates at 1 meter from "space simulator" originally as high as 20 mr/hr; shielding added on all sides until dose rate (at 1 meter) reduced to ^{less} ~~greater~~ than 2 mr/hr on all sides except back where 1 meter rate was 4 mr/hr. Back of machine is against a concrete wall and not accessible to personnel. Routine dose rate surveys now on quarterly basis by Levin. Records kept and reviewed. No other dose rate surveys now; monthly surveys ~~restricted areas~~ while Kr-85 still on hand; no dose rate greater than 2 mr/hr in unrestricted areas.

(b) Smear samples: (rest. & unrest. areas) quarterly wipes on Sr-90 and Po-210 sources by Levin as per License Condition 14D (Lic. -5). Records kept; review of same indicated gamma activity of wipes less than 10^{-6} uc, except 10^{-5} uc on 9/18/62. Beta activity all less than 10^{-5} uc.

(c) Air samples: (rest. & unrest. areas) None

3. Locking/securing of areas: Room in which space simulator stored is kept locked when not in use. ~~Keys~~ Keys limited to Keller and his technician.

H. Procurement Procedures & Control

1. Person ordering/responsible & method: Keller, as RSO, must approve orders; no material being ordered now, picture may change in future.

2. Person insuring limits not exceeded: Keller

3. Supplier: U. S. Radium Corp.

4. Summary of procurement & receipt method: (records) Receipt records reviewed back to 1960. Records previous to 1960 in archives; not immediately available but present according to Keller

5. () Preassayed: _____

() Sterilized: _____

() Leak Tested: _____

I. Storage & Security of Material - *See Item I 3, above*

(Un)restricted Area (Un)locked space Summary: _____

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

1. Sanitary sewer None

2. Burial None

3. Transfer ^{all (550, 160, 160 mcs)} Three Kr-85 sealed sources to Crossroads Marine as waste in July 1963; records kept; tritiated foils transferred to N.R. Corp. factory in Newton; Dr. Keller couldn't find records, felt they must be on hand but would require search. H₃ sources now replaced by radium; no intention to use H₃ again for this purpose.

4. Incineration none

K. (X) Posting of Areas CRA CHRA CRM CARA In Room B12

(X) Labeling Containers () Tagging Sources

(X) AEC-3 posted & where: yes - Room B12

Summary: Activity and assay dates posted on CRM labels, with radiation symbols, accounting for Sr-90 and Po-210 sources within machine.

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

1. Film Badge: supplier Landauer Jr., Inc., Matteson, Illinois ~~used~~

Frequency weekly to end of 1962 - now monthly

review of records: (persons & readings) highest dose recorded,

50 mr total for calendar year 1962