Form AEC-591
(6/1/65)

UNITED STATES ATOMIC ENERGY COMMISSION
DIVISION OF COMPLIANCE

INSPECTION FINDINGS AND LICENSEE ACKNOWLEDGMENT

E(d) II

1. LICENSEE	2. REGIONAL OFFICE
DEPARTMENT OF THE ARMY U. S. ARMY ELECTRONICS COMMAND FORT MONMOUTH, NEW JERSEY 07703	U. S. Atomic Energy Commission Region I, Division of Compliance 376 Hudson Street New York, New York 10014
3. LICENSE NUMBER(S)	**4. DATE OF INSPECTION**
29-01022-06	October 13 and 14, 1966 (Reinsp.)

5. INSPECTION FINDINGS

- [x] A. No item of noncompliance was found.
- [ ] B. Rooms or areas were not properly posted to indicate the presence of a RADIATION AREA. 10 CFR 20.203(b) or 34.42
- [ ] C. Rooms or areas were not properly posted to indicate the presence of a HIGH RADIATION AREA. 10 CFR 20.203(c) (1) or 34.42
- [ ] D. Rooms or areas were not properly posted to indicate the presence of an AIRBORNE RADIOACTIVITY AREA. 10 CFR 20.203(d)
- [ ] E. Rooms or areas were not properly posted to indicate the presence of RADIOACTIVE MATERIAL. 10 CFR 20.203(e)
- [ ] F. Containers were not properly labeled to indicate the presence of RADIOACTIVE MATERIAL. 10 CFR 20.203(f) (1) or (f) (2)
- [ ] G. Storage containers were not properly labeled to show the quantity, date of measurement, or kind of radioactive material in the containers. 10 CFR 20.203(f) (4)
- [ ] H. A current copy of 10 CFR 20, a copy of the license, or a copy of the operating procedures was not properly posted or made available. 10 CFR 20.206(b)
- [ ] I. Form AEC-3 was not properly posted. 10 CFR 20.206(c)
- [ ] J. Records of the radiation exposure of individuals were not properly maintained. 10 CFR 20.401(a) or 34.33(b)
- [ ] K. Records of surveys or disposals were not properly maintained. 10 CFR 20.401(b) or 34.43(d)
- [ ] L. Records of receipt, transfer, disposal, export or inventory of licensed material were not properly maintained. 10 CFR 30.51, 40.61 or 70.51
- [ ] M. Records of leak tests were not maintained as prescribed in your license, or 10 CFR 34.25(c).
- [ ] N. Records of inventories were not maintained. 10 CFR 34.26
- [ ] O. Utilization logs were not maintained. 10 CFR 34.27

Charles E. Coner
(AEC Compliance Inspector)

6. LICENSEE'S ACKNOWLEDGMENT

E(d)4

The AEC Compliance Inspector has explained and I understand the items of noncompliance listed above. The items of noncompliance will be corrected within the next 30 days.

Information in this record was deleted in accordance with the Freedom of Information Act, exemptions 6 b(1) b(2) b(6)

(Date) (Licensee Representative)

COPIES: [ ] LICENSEE; [ ] COMPLIANCE REGION; [ ] DIV. OF ST. & LIC. REL.; [ ] DIV. OF COMPLIANCE

INSPECTION NOTES

Notes Reviewed By G. 11/3/6

Inspector COMER, CE

LICENSEE: Dept of The Army
U.S. Army Electronics Research + Development Laboratory
Fort Monmouth, New Jersey

Lic. No. 29-1022-6

Type Inspection: (I) (RI) (Announced) (Unannounced) Date October 13, 1966

I. GENERAL INFORMATION

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

B. Persons Accompanying:

Name	Position/Organization
1. None	
2.	

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

1. Mr B. Markow, Chairman ECOM Isotopes + Ionizing Radiation Committee; reports to Dr. S. B. Levin

Experience: S. B. Levin Ph.D. Director, Institute for Exploratory Research, USA Electronics Command, Fort Monmouth

2. Ronald V. Alves 1st Lt. proposed RSO, reports to B Savaiko Safety Director ECOM

Experience:

3. W. J. Romm, Ph.D RSO reports to Dr. S.B. Levin

Experience:

For person(s) acting as RSO summarize authority: R.S.O reviews findings and recommendations of B. Markow who now does all the foot work of R.S.O.

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

Members, Position & Who report to
1. See Incl #1
2.
3.

Scope & Authority of Committee: See page 2 of USAELRDL Memo # 385-5 dated 17 Feb 64 which is attached to Form AEC 313 dated 16 July 1965

NONCOMPLIANCE NOTED

Item	See Page, Para	Item	See Page, Para

E. Organization and Administration:

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

Specified in ECOM Reg # 385-5. Candidate writes D.F. to Mr Morkow. Morkow consults with Ramm (RSO) and other committee men (by telepho if proposal is simple; at next quarterly meeting if the proposal warrants discussion) If committee approves both Morkow + Ramm sign a procurem request. Committee reports directly to Dr. Levin who in turn reports to C.G. ECOM who reports to Army Materiel Command. Dept of Army.

Note: Morkow said proper address for licenses should be:

Dept of the Army, U.S. Army Electronics Command, Fort Monmouth Ne Jersey 07703

The title of Committee; ECOM Isotopes and Ionizing Radiation Committee

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/quanti

Incl #2 shows a current inventory. I checked it and found no excession of license. Incl #3 shows use rate since last inspection

(over for add'l info)

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

(a) Many - I spot checked film badge reports against authorizations and found no one using material without authorization it committ

(b)

(c)

F. 3. Facilities:
Licensee uses: (X) Lab (X) Counting room (X) Fume Hood (X) Dry Box
(X) Table/bench (X) remote hand. equip. (X) protective clothing
( ) Other

Describe checked items: They posses no unsealed material except tritium targets and Po-210 plated sources (1.73 mc) Most sealed sources are used in Bldg 401-11 (the "Radiation Shield"). In Bldg 45 they have a counting room and a "hot lab" containing a Kewaunee type fume hood and a glove box. However this area is unus Material is stored in a 1-room building T-383.

4. Restricted Area Established ✓ Describe Bldg T-383 and Bldg #45 and Bldg Bldg 401. Has one entrance which is controlled by Mrs Rockhill - buzzer entrance Bldg T-383 is locked and key must be signed out from locked cabinet.

5. Summary of Handling Procedures/Operations:
All routine handling procedures are contained in written directives All nonroutine procedures are proposed to committee, approved and monitored by an h.p.

6. Instrumentation & Calibration Procedures:
I noted many instruments and inspected the calibration log (3-month calibrations) Nucl Chi Model 2612 G.M 4 ea, Juno Model 6 and Model 3, AN/PDR 46 3 ea, AN/PDR 27J 2 ea, Nucl Chi 2610A G.M 2 ea, IM-108, AN/PDR 39 2 ea, Lab Monitor Tracerlab Model 3B, "Chirpee" Atom. Access 10 ea, Nucl Chi Alpha Survey Model 2670 and 2671 (neutron) Atomic Access. Model TSM 91

7. Other Notes: e.g. for radiographer usage rate, exposure times, time spent in high radiation area

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

1. Instructions, oral & written: ECDM Reg 385-5 is given to each user. Specific instructions for routine uses such as the UDM-1 and 1A are given to the users. In my inspection I discussed the safe use with the authorized users and found them to be well instructed.

Licensee not complying with written procedures as follows: None

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

(a) Direct reading - restricted areas

Monthly surveys of all restricted areas. I examined the records and noted that exposure rates were recorded extensively in Bldg T-383 and #45

unrestricted areas Each month the areas outside Bldg T-383 and #401 are monitored and results recorded

(b) Smear samples: (rest. ~~& unrest.~~ areas) At least 10 swipes per month are made of the area within the storage building (T-383)

(c) Air samples: (rest. & unrest. areas) They have an Atomic Accessories Tritium Monitor Model TSM-91 at the Fort Hancock facility. When the neutron generator is put to use they will operate the monitor continuously.

3. Locking/securing of areas: I noted that all buildings in which material was stored or used were locked (Bunker at Fort Hancock, Bldg T-383, Bldg #401 and Bldg #45).

H. Procurement Procedures & Control

1. Person ordering/responsible & method: All requisitions are signed by both Dr Romm and Mr Markow

2. Person insuring limits not exceeded: Mr Markow - Physical inventory semi an

3. Supplier: I did not note

4. Summary of procurement & receipt method: (records) They do not retain copies of shipping documents but they do maintain a log showing identity quantity and date of receipt or disposal

5. ( ) Preassayed: NA

( ) Sterilized: NA

( ) Leak Tested: Records inconveniently kept but I spot checked 6 sources and fo that they had been given timely tests.

I. Storage & Security of Material

(~~un~~)restricted Area (~~un~~)locked space Summary: Bldg T-383 Locked and key kept in a locked key cabinet. Must be signed out.

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

1. Sanitary sewer None

2. Burial None

3. Transfer All waste is shipped to Edgewood Arsenal. I shipment 11/65 since last inspection (see Item # 4). I spoke to Mr Markow about estimating curies on miscellaneous waste shipments. Will do in future

None

4. Incineration None

K. ( ) Posting of Areas CRA CHRA CRM CARA
(✓) Labeling Containers ( ) Tagging Sources
(✓) AEC-3 posted & where: Bldg T-383, #401 and #45

Summary: Area in #401 where UDMH and IA are used is posted CRA of accessible a and CHRA within interlocked enclosure. Same at Ft. Hancock. Storage building is posted CRM and CRA. I inspected at least 12 use and storage containers and found them properly labeled.

LIFT UP FOR PAGE 6

L. Personnel Monitoring Program (Yes) (No) - ( ) AEC-4 ~~( ) AEC-5~~ DD 1141

1. Film Badge: supplier Lexington-Blue Grass Army Depot

frequency monthly

review of records: (persons & readings) The average exposure for approximately 50 persons was < 20 mr/month. I noted that the highest exposure was 150 mrem/mo. read by a machinist who repaired the positioning mechanism for the 3.5 Kilocurie source (Lic-7). However his average quarterly exposure was < 100 mrem

2. Wrist badge: supplier Same Frequency monthly

Records: Approx 12 badges/mo. no exposure > 100 mrem

3. Dosimeters: Supplier: IM-9B, IM-141, Bendix Read by: User

Records (persons & readings) Records show daily exposure, none over 20 mr

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

Describe: One time - Tracerlab - <10 pc/liter for 12 persons June '66

No persons have been handling unsealed tritium targets yet. This bioassay was, according to Mr. Morrow, taken to provide "a base line."

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

Using an NMC G.M Survey Meter Ser # 5675 calibrated by HASL 8/25/66 I monitored exposure rates in the unrestricted area outside Bldg T-383 and Bldg #45. All exposure rates were less than 0.5 mr/hr except at the East wall of Bldg #45 where it measured 2.5 mr/hr at 18". Mr. Morrow rearranged the material in the building and the exposure rate dropped to < 0.5 mr/hr. I cautioned him that the exposure rate should not exceed $\frac{100}{168}$ mr/hr

I also took two smear samples in the storage building and found that the removable contamination was undetectable

AEC CONTRACTS ( ): None

II. Compliance with 10 CFR

A. 10 CFR 20:

N/C	OK	NA	Paragraph	Topic
	✓		101(a)	Exposure limits in Rest. 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)	Posting High Rad. Areas w/CHRA
		✓	203(d)	Posting Airborne Areas w/CARA
	✓		203(e)	Posting 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)	Disposal to Sanit. Sewer - monthly/yearly limits
		✓	304	Disposal by burial - limits in (a)(b)(c)
		✓	305	Disposal by 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

N/C	OK	NA	Paragraph	Topic
			3	License requirements - use as lic. stipulate
			9	Exempt concentrations per 30.73
			23	Reg. for issuance of specific lic. - general
			24	Reg. for issuance of specific lic. - specifi i.e. human use by inst. & phys, rad. etc.
			41(a)	Records - receipt, transfer, export, dispos

LIFT UP FOR PAGE 10

C. License Conditions: (refer by no.)

11 a. 200 curies Co 60 may be used at: Oakhurst, NTS, Lakehurst + Fort Huachuca

b 50 mc of Sr-90 (light sources) may be used at Oakhurst and Thule.

c. 2 c Ml Co-60 may be used at Fort Greeley

12 Comply with 10 CTR 20

13 Use under supervision individuals designated by Iso. Comm.

14 Sealed source requirements

15. Labeling sealed sources used outside of shielded containers

16. Use in accord with statements of application dated July 16, 1965 and amendment Feb 22 1965, June 8, 1966

I inspected each condition and found no instance of noncompliance

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

Hyder - Nov 6, 1964

Storage containers not properly labeled
Records of leak tests not maintained

All ok this time.

I gave a clear 591 to Mr. Markow, Chairman.

MEMBERS OF THE ECOM ISOTOPES COMMITTEE

Basil Markow, Chairman, ECOM Isotopes and Ionizing Radiation Committee

Dr. Wolfgang J. Ramm, Radiological Protection Officer

Richard Rast, Physical Chemist, CS & TA Laboratory

Dr. Horst H. Kedesdy, Director, Institute for Exploratory Research Div 'E'

Lt. Col. James A. Robertson, Chief, Logistics Division

Dr. Gernot Winkler, Director, Institute for Exploratory Research Div 'S'

Bernard Savaiko, Safety Director, ECOM

Captain Ralph B. Carruthers, Chief, Preventive Medicine, PAH

Lt. Ronald V. Alves, New proposed Radiological Protection Officer, Safety Office

Mrs. Lynda J. Rockhill, Secretary, ECOM ISotopes and Ionizing Radiation Committee

Incl #1

LIST OF ISOTOPES

13 Oct 66

ISOTOPE	ACTIVITY	SERIAL NO.	LOCATION
Au^{198}	Gold Foils		T-383 K
Bi^{210}	.0172 microcuries	B 1243	Bldg. 51
Carbon 14	.194 microcuries	B 1243	Bldg. 51
Carbon 14 (orange)	4.3 millicuries	13869	I. Cantor
Carbon 14 (yellow)	.75 millicuries	13873	I. Cantor
Carbon 14 (red)	5.5 millicuries	133871	I. Cantor
Carbon 14 (blue)	4.0 millicuries	13870	I. Cantor
Carbon 14 (green)	.75 millicuries	13872	I. Cantor
Cobalt 57	1 millicurie		A. Tauber Hexagon
Cobalt 57	3.53 microcuries	GD 566	Bldg. 51
Cobalt 60	1 millicurie	Tracerlab R-30	T-383
Cobalt 60	1 millicurie	" R-30	T-383
Cobalt 60	.022 microcurie	B 1243	Bldg. 51
Cobalt 60	.766 microcurie	GD 566	Bldg. 51
Cobalt 60	7.12 curies	21	UDM-1 Bldg. 401
Cobalt 60	3540 curies		Underground Vault
Cesium 137	120 curies	120	UDM-1A Bldg. 401
Cesium 137	1 microcurie	GD 566	Bldg. 51
Cesium 137	220 curies	123 send all for recladding of U shield	Bldg. 401 (EON)
Cesium 137	220 curies	125	Bldg. 401 (EON)
Deuterated Target Disks With H^3 targets for Van De Graaff			T-383 C-12
Krypton 85	50 millicuries	46 — for disposal	T-383 K
Mn^{54}	1.55 microcuries	GD 566	Bldg. 51
Na^{22}	.952 microcurie	GD 566	Bldg. 51

Incl #2

ISOTOPE	ACTIVITY	SERIAL NO.	LOCATION
Pa^{234}	.0141 microcurie	B 1243	Bldg. 51
Polonium 210	100 microcuries	A-389	Bldg. 45
Polonium 210	1.63 millicuries	Po-115	Bldg. 45
Plutonium 239	~~0.530~~ 1.89 microcuries	P-139	T-383
Plutonium 239	~~0.578~~ 1.73 microcuries	P-4	T-383 C-9
Radium	1 millicurie	0-204	T-383 F
Radium	1 millicurie	208	T-383 A-8
Radium	10.3 millicuries		T-383 G
Radium-Beryllium	20 millicuries		T-383 G
Strontium 90 - Sulphate	25 millicuries	115	Oakhurst I. Cantor
Strontium 90 - Sulphate	25 millicuries	116	Oakhurst I. Cantor
Strontium 90 - 3 sources	63 millicuries	101	T-383 H
Strontium 90	3 microcuries	279 victoreen	Underground Vault
Strontium 90	10 microcuries	286	T-383 D-8
Strontium 90	3 microcuries	321 victoreen	T-383 D-10
Strontium 90	1 millicurie	187	Underground Vault
Strontium 90	1 millicurie	71 victoreen	T-383 D-2
Strontium 90	1 millicurie	225	T-383 D-1
Strontium 90	3 microcuries	141	Underground Vault
Strontium 90	3 microcuries	175	Underground Vault
Strontium 90	3 microcuries	230	Underground Vault
Strontium 90	3 microcuries	152	T-383 9
Strontium 90	3 microcuries	240	Underground Vault
Strontium 90	40 millicuries	2425	T-383 K
Tritium	9.5 curies	375	Cellar Van de Graaff

ISOTOPE	ACTIVITY	SERIAL NO.	LOCATION
Tritium (titanium & copper foil)	7.06 curies	9530	T-383 B-C
Tritium Target	7 curies		Fort Hancock
Tritium Target	9.0 curies	P79094	T-383 C-12
Tritium Target	9 curies	P-9094	T-383 C-12
Tritium Target	5 curies	CT-451	T-383 C-2
Tritium Target	5 curies	CT-452	T-383 C-2
16-Tritium $2mm^2$	.65 curies	USRC 615	T-383 C-11
Tritium	.05 curies	USRC 615	T-383 C-11
Tritium	.30 curies	USRC 615	T-383 C-11
Tritium	6.3 curies	USRC 616	T-383 C-10
Tritium	.7 curies	USRC 616	T-383 C-10
Tl^{204}	.0246 microcuries	B 1243	Bldg. 51
Uranium 238 shield for MRC-894		123	Bldg. 401 (EON)
Uranium 238 shield for MRC-894		125	Bldg. 401 (EON)
Uranium 238 Oxide glass #1			T-383 B-1
Uranium 238 Oxide glass #2			T-383 B-1
Uranium 238 (depleted)			T-383 B-9
Uranium 238 (depleted)			T-383 B-9

PURCHASES

Radium	1 millicurie		11 Feb 66	
Cesium 137	220 curies	123	1965	auth 2/25/65 by Amendment #4
Cesium 137	220 curies	125	1965	
Tritium target	9.5 curies	375	April 1966	ok see A # 5 (F)
Tritium (titanium & copper foil)	7.06 curies	9530	9 Aug 66	"
Tritium target	7 curies		9 Aug 66	"

Incl #3

LIST OF RADIOACTIVE WASTE FOR DISPOSAL

1 Box — Trace U^{235} and irradiated Kovar .510 milligrams
28 x 28 x 29 High — 200 lbs.
Less than 1 mr at 1 meter
6 mr at contact

1 Box — Irradiated Material (Fission Products Crystal Units)
26 x 29 x 29 High — 200 lbs.
1 mr at 1 meter
12 mr at contact

1 Box — Strontium Hexflouride 3 Containers 7 x 21 x 14 High 40 lbs. ?
Cobalt 60 1 millicurie each Serial No. 1 & 2
1 mr at 1 meter
5 mr on contact

2 Boxes — Radium Powder 200 microcuries and 400 microcuries
27 x 27 x 26 High — 30 lbs. each
1 1/2 mr on contact

1 Can — Miscellaneous Waste 20" diameter x 28" High — 60 lbs.
1 mr at 1 meter
5 mr on contact

1 Box — Strontium 90 experimental model TS-784 Serial No. 85 30 millicuries
24 x 21 x 13" High — 60 lbs.
5 mr at 1 meter
20 mr on contact

1 Lead Pig — Krypton 85 855 millicuries
8" High x 8" Diameter — 100 lbs.
5 mr at 1 meter
15 mr at contact

2 Lead Pigs — Cobalt 60 1 millicurie each
6" Diameter x 5" High — 25 lbs.
1 mr at 1 meter
10 mr on contact

1 Bag — Mixed Isotopes
3" x 12" x 12" — 1 lbs.
1 mr on contact

1 Cardboard Container — Cu^{64} Cd^{115} Sn^{121} 2.25 microcuries
16" Diameter x 16" High — 40 lbs.
4 mr at 1 meter
20 mr on contact

Incl #4

1 Box Containing 18 x 14 x 8 25 lbs.
15 Luminous Buttons Radium
Strontium 90 4 millicuries each 8 millicuries total
Carbon 14 .103 microcuries and .107 microcuries
Thorium Oxide
5 Electron tubes
Uranyl Nitrate 1 lb.
Carbon 14 Benzoic Acid 1.48 microcuries/gram
Strontium 90 24 millicuries
$Na_2 C^{14} O_3$ .75 microcuries
$Na_2 C^{14} O_3$ .768 microcuries
Isolite Radium Serial No. 58 82.2 microlamberts
Cobalt 57 Mossbauer Source 1 millicurie
Radium 226 400 microcuries Vacuum Gauge Model 520
National Research Corporation
1 mr at 1 meter
3 mr on contact

1 Pig Contains 7" x 7" x 10" High 135 lbs.
Radium Foils 710 micrograms
Radium Bromide 215 micrograms
Cobalt Cloride 63 microcuries
Less than 1 mr on contact

1 Box Cobalt 60 8 millicuries each unit
Four units total 32 millicuries total amount

I have received on this date 4 Aug 65 the above listed radioactive waste for shipment to Edgewood Arsenal, Edgewood, Maryland.

Karl K Domingoes
1ST LT CmDC

Technical Escort Unit
Edgewood, Maryland

Cobalt 60 53.8 curies disposed of July 1966.