Robert Lowenstein, Acting Director
Division of Licensing and Regulation, Hq.

JUN 30 1961

Robert W. Kirkman, Director
Compliance Division, NY

TRANSMITTAL OF LICENSE COMPLIANCE INSPECTION REPORT - 10 CFR 30

CMP:EE

Transmitted herewith is a license inspection report involving noncompliance:

UNITED STATES ARMY, DEPARTMENT OF
EVANS SIGNAL LABORATORY
Belmar, New Jersey

License 29-1022-6

The following items of noncompliance were observed or noted during the course of this inspection:

License Condition 18(C)
- in that leak tests have not been performed at six month intervals on two 100 c Co-60 sealed sources as required by the license condition. (See item 12C of report details.)

20.203 "Caution signs, labels, and signals"
(c)(1) "High Radiation Areas"
- in that the high radiation area which exists in Building 401 during the use of the 2.3 c Co-60 source or the 120 c Cs-137 source was not posted. (See item 17 of report details.)

(b) "Radiation Areas"
- in that a radiation area which exists continuously in Building 383 from the storage of millicurie amounts of byproduct material was not posted. (See item 17 of report details.)

Portions Ex 6

Information in this record was deleted in accordance with the Freedom of Information Act, exemptions 6
FOIA- 2006-0238

COMPLIANCE

EPSTEIN:am KLEVIN KIRKMAN
6/29/61

HH/1

(f)(1) "Containers"
- in that lead pigs within the storage vault of Building 383 containing 844 mc Co-60, 370 mc Pm-147, 33 mc Sr-90, 1.5 mc Tl-204 and 2 mc Ag-110 did not have labels reading, "Caution - Radioactive Materials". (See item 17 of report details.)

(f)(4)- in that lead pigs within Building 401 containing 2.3 c Co-60 and 120 c Cs-137, and a box of tools in Building 45 which had radiation levels of 1.5 mr/hr, did not have labels reading, "Caution - Radioactive Materials", nor labels which indicated the date of assay. (See item 17 of report details.)

(4)- in that the two lead pigs each storing 100 c Co-60 as sealed sources did not have a label which indicated the kind, quantity and date of assay. (See item 17 of report details.)

20.403 Notifications and Reports of Incidents - Old Part 20
(c)- in that the licensee did not make a report to the Commission within thirty days of a whole body exposure to [ ] of 1050 mrem which occurred during one day during the week of November 13, 1960. (See item 18 of report details.) Ex 1

The items of noncompliance were discussed with Mr. John Crull, Executive Manager of USARSDL, with B. Markow, Chairman of the Isotope Committee, and with Mr. James Aldrich, Post Safety Officer. It was pointed out to these gentlemen that items of noncompliance were recurrent.

With regard to recurrent item of noncompliance, failure to conduct leak tests, Markow stated the two Co-60 sources were in storage at the time when leak tests were performed and had been overlooked. With regard

JUN 30 1961

to recurrent items of noncompliance with 20.203(c)(1) and f(1&4), Markow admitted he had not properly posted containers and areas.

Mr. Crull ordered Aldrich in the inspectors presence to supervise the correction of the items of noncompliance and directed Aldrich to personally report to him the results.

It was pointed out to Crull that there was residual Sr-90 contamination in and about the "Hot Lab". Crull instructed Aldrich to immediately look into the matter and report. A letter dated June 2, 1961 was received from the licensee which stated the "Hot Lab" and Change Rooms are closed pending decontamination, and that the details of the decontamination procedure will be forwarded to this office. The letter also stated that items of noncompliance involving 20.203 c(1), (b) and f(1&4) have been corrected. (See Exhibit "A")

No citation is being made for 20.203 f(4) regarding a Victoreen alarm which contained four 10 uc Sr-90 sealed sources for storage and use pursuant to Inspection Guide Memorandum 33 dated 6/13/61.

No hazard exists in view of the licensee's voluntary action in closing the "Hot Lab" and Change Room. No follow-up inspection will be made.

We recommend that a letter be sent the licensee advising of the items of noncompliance and requiring corrective action to the satisfaction of the Commission.

Enclosure:
1 cy of Rpt.

cc: Div of Cmp., Hq.
w/orig. of Rpt.

Form AEC-417
(4-58)

UNITED STATES ATOMIC ENERGY COMMISSION

COMPLIANCE INSPECTION REPORT

1. Name and address of licensee

UNITED STATES ARMY, DEPARTMENT OF
EVANS SIGNAL LABORATORY
Belmar, New Jersey

2. Date of inspection: May 18, 1961

3. Type of inspection: Reinspection

4. 10 CFR Part(s) applicable: 20 - 30

5. License number(s), issue and expiration dates, scope and conditions (including amendments)

License No.	Date	Exp. Date
29-1022-6	3/15/61	3/31/63

SCOPE:
A. 1000 millicuries of each byproduct material between Atomic Nos. 3 to 83, inclusive except as follows: of any byproduct material between Atomic Nos. 3 to 83, inclusive in any form,
B. 440 curies total with no single source to exceed 200 curies of Cobalt 60 as sealed sources,
C. 125 curies of Cesium 137 as an ORNL sealed source,
D. 10 millicuries of Polonium 210 in any form,
E. 12.5 curies of Polonium 210 in Mound Laboratory sealed source drwg. 1-4817,
F. 10 curies of Hydrogen 3 as tritium zirconium targets, all to be used in Research and Development as defined in Section 30.4 (k) of Title 10, Code of Federal Regulations, Part 30, "Licensing of Byproduct Material".

(CONT'D)

6. Inspection findings (and items of noncompliance)

The Evans Signal Laboratory is a division of Fort Monmouth. All isotopes are used within a restricted and security controlled area. An active isotope committee authorizes and supervises the uses of all materials. James Aldrich, Safety Officer of Fort Monmouth, is the RSO. Aldrich has had courses in radiation safety at ORINS. A Health Physicist, Mrs. Blanche Williams, performs surveys and is in full charge of radiation safety. Facilities for use and storage are adequate. Records of receipt of materials, use, surveys, personnel monitoring and disposal are maintained. The only items of noncompliance observed or noted during the course of the inspection are as stated below:

License Condition 18(C)
- in that leak tests have not been performed at six month intervals on two 100 c Co-60 sealed sources as required by the license condition. (See item 12C of report details.)

20.203 "Caution signs, labels, and signals"
(c)(1) "High Radiation Areas"
- in that the high radiation area which exists in Building 401 during the use of the 2.3 c Co-60 source or the 120 c Cs-137 source was not posted. (See item 17 of report details.)

(CONT'D)

7. Date of last previous inspection: September 16 & 17, 1959

8. Is "Company Confidential" information contained in this report? Yes ☐ No ☒
(Specify page(s) and paragraph(s)) ALL

DISTRIBUTION:

Orig - Div of Cmp., Hq.
1 cy - DL&R
2 cys - NY

Eugene Epstein
(Inspector)

Approved by: Robert W. Kirkman, Director
New York
(Operations office)

June 29, 1961
(Date report prepared)

If additional space is required for any numbered item above, the continuation may be extended to the reverse of this form using foot to h format, leaving sufficient margin at top for binding, identifying each item by number and noting "Continued" on the face of form un appropriate item.

10—73814-2 U. S. GOVERNMENT PRINTING OFFIC

RECOMMENDATIONS SHOULD BE SET FORTH IN A SEPARATE COVERING MEMORANDUM

ITEM 5 (CONT'D)

License No.	Date	Exp. Date
29-1022-6	3/15/61	3/31/63

SCOPE: continued -

G. 1.5 curies of Strontium 90 as chloride in acid solution,
H. 80 curies of Hydrogen 3 as New England Nuclear Corp. light sources,
I. 6.3 curies of Krypton 85 as New England Nuclear Corp. ligh sources, all to be held in storage and transferred to an Atomic Energy Commission authorized recipient by May 1, 1961.

CONDITIONS: #11-Byproduct materials specified below may also be used at the following locations:

(a) Cobalt 60 sealed sources of up to 200 curies may be used at the Oakhurst Tower Station, Ocean Township, New Jersey; Nevada Test Site; Pacific Proving Grounds; Lakehurst Naval Air Station, New Jersey; Fort Huachuca, Arizona.

(b) Strontium 90 light sources of up to 50 millicuries may be used at Oakhurst Tower Station, Ocean Township, New Jersey and Thule, Greenland.

(c) Cobalt 60 sealed source of up to 3 curies may be used at Fort Greeley.

#12-The licensee shall comply with the provisions of Title 10, Code of Federal Regulations, Chapter 1, Part 20, "Standards for Protection Against Radiation". #13-Byproduct materials shall be used by, or under the direct supervision of, individuals approved by the local Isotope Committee, Mr. B. Markow, Chairman. #14-A curie of Iridium 192 is defined as that quantity of activity which presents a radiation intensity of 0.55 roentgen per hour at a distance of one meter. #15-Each sealed source of license material to be used outside of a shielded exposure device shall bear a durable, legible and visible tag permanently attached to the source. The tag shall be at least one (1) inch square, shall bear the conventional radiation symbol prescribed in Section 20.203(a) of Part 20 and a minimum of the following instructions: DANGER, RADIOACTIVE MATERIAL, DO NOT HANDLE, NOTIFY MILITARY AUTHORITIES IF FOUND. Repair or replacement of tags shall be accomplished by persons specifically licensed by the Commission to perform this service. #16-Except as otherwise specifically provided for in the license, the licensee shall possess and use byproduct material described in items 6, 7 and 8 of this license in accordance with statements, representations, and procedures contained in his application dated February 20, 1961, and in related documents and amendments as follows:

A. Administrative instructions entitled "Prevention

ITEM 5 (CONT'D)

License No.	Date	Exp. Date
29-1022-6	3/15/61	3/31/63

CONDITIONS: continued -

and Control of Radiation Hazards", dated January 27, 1961 and the eight enclosures included therewith.

#17-Written administrative instructions referenced in Condition 16A covering radiological protection, control, and security of byproduct material shall be followed and a copy of instructions shall be supplied to each individual using or having responsibility for use of such material. Any changes in the administrative instructions shall have the prior approval of the Isotopes Branch, Division of Licensing and Regulation.

#18- A. Each sealed source acquired from another person and containing byproduct material with a half-life greater than 30 days and in any form other than gas, shall be tested for contamination and/or leakage prior to use. In the absence of a certificate from a transferror indicating that a test has been made within six (6) months prior to the transfer, the sealed source shall not be put into use until tested.

B. Each sealed source fabricated by the licensee shall be tested for contamination and/or leakage immediately after fabrication. If the test reveals the presence of 0.005 microcuries or more of removable contamination, the licensee shall repair and/or decontaminate and retest the source. Sealed sources fabricated for distribution and containing byproduct material (with the exception of solid metallic Iridium 192, byproduct material with a half-life not exceeding thirty (30) days, and byproduct material in the form of gas) shall, in addition to an initial test upon fabrication, be stored for a period of seven days and retested prior to being distributed.

C. Each sealed source containing byproduct material with a half-life greater than thirty (30) days and in any form other than gas, shall be tested for leakage and/or contamination at intervals not to exceed six (6) months, except that sources designed as an alpha emitting source shall be tested at intervals not exceeding three (3) months.

ITEM 5 (CONT'D)

License No.	Date	Exp. Date
29-1022-6	3/15/61	3/31/63

CONDITIONS: continued -

D. The test shall be capable of detecting the presence of 0.005 microcuries of removable contamination on the test sample. The test sample shall be taken from the sealed source or from appropriate accessible surfaces of the device in which the sealed source is permanently or semipermanently mounted or stored. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission.

E. If the test required in A or C above reveals the presence of 0.005 microcuries or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Commission regulations. A report shall be filed within five (5) days of the test with the Director, Division of Licensing and Regulation, U. S. Atomic Energy Commission, Washington 25, D. C., describing the equipment involved, the test results and the corrective action taken. A copy of such reports shall be sent to the manager of the nearest AEC operations office listed in Appendix D of Title 10, Code of Federal Regulations, Part 20.

ITEM 6 (CONT'D)

(b) "Radiation Areas"
- in that a radiation area which exists continuously in Building 383 from the storage of millicurie amounts of byproduct material was not posted. (See item 17 of report details.)

(f)(1) "Containers"
- in that lead pigs within the storage vault of Building 383 containing 844 mc Co-60, 370 mc Pm-147, 33 mc Sr-90, 1.5 mc Tl-204 and 2 mc Ag-110 did not have labels reading, "Caution - Radioactive Materials". (See item 17 of report details.)

(f)(4) - in that lead pigs within Building 401 containing 2.3 c Co-60 and 120 c Cs-137, and a box of tools in Building 45 which had radiation levels of 1.5 mr/hr, did not have labels reading, "Caution - Radioactive Materials", nor labels which indicated the date of assay. (See item 17 of report details.)

ITEM 6 (CONT'D)

(4) - in that the two lead pigs each storing 100 c Co-60 as sealed sources did not have a label which indicated the kind, quantity and date of assay. (See item 17 of report details.)

20.403 Notifications and Reports of Incidents - Old Part 20
(c) - in that the licensee did not make a report to the Commission within thirty days of a whole body exposure to [redacted] of 1050 mrem which occurred during one day during the week of November 13, 1960. (See item 18 of report details.) Ex6

PART 30 INSPECTION

DEPARTMENT OF THE ARMY
U. S. ARMY SIGNAL RESEARCH AND DEVELOPMENT
Laboratory, Evans Area
Nuclear Facilities Section
Exploratory Research Division "S"
Buildings S-45, 401, T-383 and Area C
Belmar, New Jersey

Date of Inspection: May 18, 1961 (Announced)

Persons Accompanying Inspector:

None

Persons Contacted:

James Aldrich, Post Safety Officer
Mrs. Blanche S. Williams, Health Physicist
Basil Markow, Physicist
Richard Rast, Physical Scientist
John Crull, Executive Manager of USARSDL

DETAILS

9. Background

An initial inspection of the licensee's facility was conducted on 9/16,17/59 by Mr. J. R. Roeder of this office under License -5. The following items of noncompliance were noted:

Conditions 20 and 21 of the License
- in that numerous sources were not leak tested at prescribed intervals.

20.203 "Caution signs, labels and signals"
(c) "High Radiation Areas"
(1) - in that the high radiation area which exists in Building 401 during the use of the 9 Co-60 source on the 120 c Cs-137 source is not posted.

(2) - in that the high radiation area existing during the use of the 9 c Co-60 source or the 120 c Cs-137 source is not equipped with an audible or visible alarm or control device which causes the level of radiation to be reduced.

- in that (1) entrance to Gate #2 can be obtained during exposure of the 120 c Cs-137 source and (2) entrance through Gate #1 can be obtained during exposure of the 9 c Co-60 source.

(e) "Additional requirements"
- in that Buildings 45, 401, and 383 were not posted as required by this section.

(f) "Containers"
(1&4)- in that the following containers were not labeled:

(1) nine 55 gallon drums pending disposal to Earle Naval Depot, New Jersey, and (2) containers housing a 200 c Co-60 source and a 27 c Co-60 source; and that all other storage containers were labeled "Danger - Radioactivity" (with prescribed symbol) with kind, therein, and the date, but the words "Danger - Radioactive Materials" and amount of material therein, were not indicated.

30.3 "License Requirements"
- in that the licensee possessed Sr-90 in excess of the license limits.

30.41 "Records"
- in that some records of receipt did not list the amount of material.

The initial inspection report was transmitted to DL&R on 11/2/59. DL&R by letter dated 12/2/59 informed the licensee of the items of noncompliance and requested a reply of within 30 days of corrective action. No reply from the licensee is included in any backup material.

L. D. Low, Division of Compliance, Headquarters, in a memo to DL&R dated 9/27/60 verified that enforcement action had not been completed.

E. G. Outten in a memo to L. R. Rogers, Assistant Director for Nuclear Materials Safety, dated 11/9/60, requested information as to whether enforcement action had been completed.

L. R. Rogers in a memo dated 11/16/60 replied that enforcement action is considered to be completed and a reinspection may be scheduled.

License -5 expired on 9/31/60 and the provisions of License -5 were incorporated in License -6 dated 3/15/61.

10. <u>Organization and Administration</u>

The Evans Signal Laboratory is a part of USASRDL (United States Army Signal Research and Development Laboratory). The Evans Laboratory is administered by Fort Monmouth, New Jersey, Headquarters for the United States Army Signal Corps. All isotopes are used in the Evans Area with occasional tests of material at the Oakhurst Tower. The Evans Area employs approximately 800 people. Mr. James Aldrich, Safety Officer of Fort Monmouth, is the RSO for USASRDL. Aldrich took a course in radiation safety at ORINS in 1956. A formal isotope committee exists at Evans which meets quarterly and acts on all requests for materials. Users must be authorized by the isotope committee. The isotope committee is constructed as follows:

B. Markow, Chairman, Chief Nuclear Facilities
Lt. Col. L. W. Green, M.D., Medical Officer
Dr. W. J. Ramm, Principle Scientist
Mrs. Blanche S. Williams, Exploratory Research Physicist
Dr. J. Batilas, M.D., Radiologist

F. Leland Burt, Security Officer
Major James Feltman, Logistics

11. Facilities and Uses of Materials

Aldrich stated that 70 people working in divisions use isotopes at one time or another and the heads of these divisions have been approved by the isotope committee. The users are as follows:

(a) Exploratory Research "S", Robert Noyes, Division Chief
(b) Applied Physics Division, Dr. Harrison J. Merrill, Ph.D.

(1) Weapons Effects, Thomas Baldwin
(2) Radiac Instruments, Martin Jackter and Joseph Nirschl

(c) Electron Tube Division, Louis Kaplan
(d) Power Sources Branch, Soloman Schneider
(e) Solid State Devices, Dr. E. A. Gerber, Ph.D.
(f) Components and Materials Branch, Dr. E. Bothe, Ph.D.

All users are supervised by B. Markow, Chief of the Nuclear Branch. Markow has a BS in Physics and attended Taft Institute, USPHS, in 1954. Mrs. Blanche Williams performs Health Physics functions at Evans. Williams has an AB from Syracuse and attended Taft and ORINS. She is a member of the National Health Physics Society.

At the time of the inspection, all isotopes were in storage except Co-60 and Cs-137 used for Radiac Instrument Calibration. An inventory record is maintained by Williams and shows the amounts of materials on hand and location:

Co-60 sealed sources 2 curies - in Building 401 in storage
Co-60 Au plated cylinder - 160 mc - in Building 383 in storage
Co-60 Au plated cylinder - 160 mc - in Building 383
Co-60 8-R-30 Tracerlab sealed sources - 6 mc total - in Building 383
Co-60 Au plated wire - 18 mc - in Building 383
Co-60 AN/UDM - 1 sealed source 2.1 c in Building 401
Co-60 AECL sealed source - 100 c - in Building 401
Co-60 AECL sealed source - 100 c - in Building 401
Co-60 Au plated cylinder - 0.5 mc - Building 383
Cs-134 as Chloride in HCL - 50 mc - in Building 383
Cs-137 AN/UDM-1A sealed source 120 c in Building 401
Cs-137 as Chloride 7.5 in Building 383
C-14 sealed light source - 15 mc - Oakhurst Tower
Kr-85 sealed light source - 3.8 mc for disposal - Building 401
Po-210 snap 3 device - 3.3 c for disposal - Building 401
Promethium 147 instrument dials - 370 mc - Building 383
Sr-90 sealed sources 10 each - 9 mc - Building 383
Sr-90 sealed source - 24 mc - Building 383
Sr-90 as Chloride in 6N - 1500 mc for disposal - in Building 401
H-3 light sources - 60 c for disposal - in Building 401
H-3 Zirconium targert - 10 c for disposal - in Building 401
H-3 lanterns 2 each - 20 c for disposal - in Building 401
Thallium 204 as Chloride - 1.5 mc - Building 383
Silver 110 Silver Nitrate - 2 mc - Building 383
Sr-90 2 each sealed light sources - 50 mc - Oakhurst Tower

The above inventory was dated 3/15/61, and indicated that source limits were not exceeded.

Byproduct material was in storage or was being used at the following locations:

Building 45

Both the Health Physics Office (Mrs. Williams Office) and the Hot Laboratory are in Building 45. The Hot Laboratory consists of four rooms adjacent to the Health Physics Office. The first room consists of a regular chemistry lab in which low level tracer work is occasionally performed. Mrs. Carol Pearce, Chemist, stated she uses the laboratory approximately once monthly for low level work with microcurie amounts of C-14. The laboratory had been used prior to 1954 for the processing of large amounts of soluble Sr-90. The records also show that there were spills of containers with 15 mc thallium and 15 mc Sr-90. Another spill of 20 mc Sr-90 occurred. All three spills occurred in September, 1953. The report goes on to state the "Hot Lab" was decontaminated. Smears taken of the "Hot Lab" show there is residual contamination within the "Hot Lab" and the change room immediately adjacent. The smear samples were analyzed by HASL, NYOO and show residual Sr-90 contamination of floor surface within the "Hot Lab" of 8.3×10^{-4} uc Sr-90/100 cm^2. It was also learned that waste Sr-90 solutions being processed in the "Hot Lab" had been disposed of down a floor drain into a subground holding tank. A smear of the floor drain shows residual Sr-90 contamination in the order of 3.7×10^{-4} uc/100 cm^2.

A letter from the licensee was received at this office on 6/2/61 which stated that the "Hot Lab" and the change room are closed pending decontamination.

Building 401

Building 401 is a short distance from Building 45. Building 45 houses a 2 MeV Van DeGraff accelerator and a 250 KVP X-Ray unit. A third room called "The Shield" has an area of approximately 800 sq. ft. and is used for radiac instrument calibration. An approximate 2.1 c Co-60 sealed source and an approximate 120 c Cs-137 sealed source are used within AN/UDM-1 and AN/UDM-1A calibration containers. The calibration devices are permanent containers and the Co-60 and Cs-137 sources are never removed. The walls of the "Shield Room" are of 18" concrete and the beam from the calibration devices are directed to a wall which has a solid bank of earth immediately outside to a height of 10 feet. A waist high wooden fence restricts entry into the area. Opening Gate #1 of the wooden fence causes the Cs-137 source to return to its shielded position. Opening Gate #2, where the Co-60 calibration unit was located, did not cause the Co-60 source to return to its shielded position but did activate an audible alarm signal. An audible alarm signal is inter-connected with both gates so that if an entry was made into either Gate #1 or Gate #2, while either source was exposed, an audible alarm signal would sound. A red visible light is also activated when either source is exposed. An alarm system to be activated by radiation levels has been procured but has not been inter-connected. The alarm system consists of four Victoreen detectors containing a total of 40 uc Sr-90. The calibration facility is directly supervised by Mr. Joseph Nirschl, a Physicist. Nirschl has been approved as a user by the isotope committee. The calibration room is also used for the storage

of materials not in use. In storage within the room at the time of the inspection, were two 100 c WECL sealed Co-60 sources and a 12 c Co-60 sealed source. Cartons containing waste byproduct material packed for disposal and transfer were also in the calibration room.

Building 383 (Storage Vault)

Building 383 is a separate storage building used solely for storage. It contained all the isotopes listed in item 10 of report details as being in storage in Building 383. The building is a block house type 12' x 12' with walls of concrete 12" thick.

Oakhurst Area

The Oakhurst Area consists of a fenced off wooded area with a steel tower 300 feet high. Experiments were performed in the past with Co-60 gamma sources to activate detectors on military aircraft. At the time of the inspection, two 50 uc Sr-90 sealed light sources were attached to a detection device at the top of the tower.

12. Radiological Safety Precautions and Procedures

A. Instructions

Condition 16 of the license requires that the licensee possess and use material in accordance with his application dated 2/20/61, and procedures dated 1/27/61. Memorandum 385-5 dated 1/27/61 entitled, "Prevention and Control of Radiation Hazards" has been distributed to all supervisors. Each individual user is required to read and initial the memorandum.

B. Surveys

Williams performs direct radiation surveys of all areas of use and storage, monthly. The survey results are embodied in a written monthly report to the chairman of the isotope committee. A direct radiation survey was made by the inspector using a #2068 Juno survey meter calibrated 5/12/61, and a #5680 NMC thin end window GM survey meter calibrated 5/5/61. The following radiation levels were noted:

Building 383 (Storage Vault)

Inside the storage vault where radioisotopes indicated in item 11 were stored - 15 mr/hr.

At the outside surface of the walls
of the storage vault - 3 mr/hr.
At 12" distance from the wall - 1.5 mr/hr.

Building 401 "The Shield"

At the surface of the AN/UDM-1
calibrator containing a 2.3 c
Co-60 source - 42 mr/hr.
At 12" from the surface - 17 mr/hr.

At the surface of the AN/UDM-1A calibrator containing a 120 c Cs-137 source - 2 mr/hr.
At 12" from the surface - 0.75 mr/hr.

At the surface of two 3" diameter lead pigs each containing a 100 c Co-60 source - 70 mr/hr.
At 6" from the surface - 40 mr/hr.
At 12" from the surface - 20 mr/hr.

At the surface of packages of materials ready for disposal containing 1500 mc Sr-90, 1000 mc Kr-85 and 60 c H-3 - 2 mr/hr.

Building 45

(1) At the surface of a metal box containing tools in Health Physics Office - 1.5 mr/hr.

Mrs. Williams stated the tools had been in her office for at least 5 years, and had belonged to a mechanic called "Irradiation Ike". The mechanic was no longer employed at USASRDL. Mrs. Williams stated it was apparent that the tool box contained contaminated tools but she did not know the source of the contaminent.

(2) In the "Hot Lab"

The floor and sink and counter-top surfaces had radiation levels of 12 mr/hr.
At 1 foot from the surface - 1.5 mrad/hr.

(note readings taken with beta shields opened.)

C. Leak Tests

The licensee is required to have tests for leakage performed on sealed sources with a half-life greater than 30 days at intervals not to exceed 6 months by License Condition 18C. Mrs. Williams maintains records showing leak tests performed on all sealed sources except two 100 c Co-60 sealed sources in storage in Building 401. Leak tests were performed on all other sealed sources at six month intervals. Tests for leakage on all other sealed sources were performed on 3/16/60, 9/20/60 and 4/1/61.

A leak test was performed by the inspector by wiping the surfaces of all containers in Building 401 with filter paper. The filter paper was monitored with the end window GM survey meter above, and no reading was noted other than 0.025 mr/hr (instrument background).

13. Instrumentation and Calibration

A check by the inspector revealed that the licensee possessed all of the instrumentation listed as part of the license application dated 2/20/61. The licensee had on hand the following operable survey meters, Model 2612B Nuclear of Chicago, AN/PDR-39, and one Juno Model 3. Instruments are calibrated quarterly by the radiac instrumentation section.

14. Storage and Security of Material

The entire Evans Area is under strict security control. All vehicles and persons carrying packages must undergo a search. Buildings 383, 45, and 401 are in a special fenced off area, and only authorized persons may enter the area. The storage vault 383 is locked at all times. The "Hot Lab" and Health Physics Office in Building 45 and Building 401 have constant security guards in attendance. All containers have locks.

15. Procurement Procedures and Control

B. Markow, Chairman of the isotope committee, stated the isotope committee must approve procurement of all materials. Procurement would be through the Army Chemical Corps. There has been no receipt of materials since the date of the initial inspection with the exception of a Victoreen monitor containing four 10 uc Sr-90 sealed sources. The monitor was procured in March, 1961.

16. Waste Disposal

Records of waste disposal are maintained showing the kind of material, date, amounts, and manner of disposal. The records show that a disposal was made to the Earle Naval Depot on August 15, 1959 of 30 mc Sr-90, 10 gms. Ra, and 20 mc Co-60. Earle disposed of the material by burial at sea. Cartons have been stored in Building 401 for approximately one year containing the following material for disposal to the Army Chemical Corps:

Kr-85 as light sources - 4.86 curies
H-3 as light sources - 60 curies
Sr-90 - 1500 mc

Markow stated the packages are ready for shipment to the U. S. Army Chemical Corps, Aberdeen, Md. who will dispose of the material in accordance with the regulations.

17. Posting and Labeling

Building 383 "The Storage Vault"

The storage vault which contained a total of 844 mc Co-60, 370 mc Pm-147, 33 mc Sr-90, 1.5 mc Tl-204 and 2 mc Ag-110 was posted with a sign at the outside door reading, "Caution - Radioactive Materials" (with symbol). The storage vault which had radiation levels of 15 mr/hr within the center of the room continuously was not posted with any sign reading "Caution - Radiation Area" with symbol. Containers within the storage vault were labeled with tags which contained the words, "Danger - Radioactivity" and with the prescribed symbols. The tags also indicated the kind, quantity and date of assay.

Building 45

Within the Health Physics Office, a box of contaminated tools which had a radiation level of 1.5 mr/hr gamma at the surface and was not labeled. The "Hot Lab" contained no

materials. There was residual contamination from Sr-90 spills which gave radiation levels of 12 mr/hr at the surface of the floor and counter-tops. The entrance to the "Hot Lab" was posted with a sign reading, "Caution - Radiation Area" with symbol.

Building 401

The entrance to the calibration room where the Co-60 and Cs-137 calibrators were located and which was used for the storage of curie quantities of Co-60 and waste materials was posted with signs reading, "Authorized Personnel Only - Warning - Do Not Stand In This Area When Red Light Is On". There was no sign reading "Caution - High Radiation Area" with symbol. Markow stated a high radiation area exists because the Co-60 calibrator has a radiation intensity in the beam of 5 R/hr at one meter and the Cs-137 calibrator has a radiation level of 300 R/hr at one meter when exposed. Markow stated the sources are exposed for more than one hour during days when instrument calibration is being performed. At other times the sources were reported to be in storage. The wall of the calibration room was posted with a sign reading, "Caution - Radioactive Materials" with symbol.

The AN/UDM-1 calibrator containing 2.3 c Co-60 sealed source had a label reading, "Danger - Radiation Hazard" with symbol and which indicated the kind and quantity. No date of assay was indicated. The AN/UDM-1A calibrator containing 120 c Cs-137 was similarly labeled. The two lead pigs each containing 100 c Co-60 had labels reading, "Caution - Radioactive Materials" with symbol. The kind of material was indicated, but there was no statement of the quantity or date of assay. The material was reported by Williams to be stored and not used. A Victoreen monitor containing 4-10 uc Sr-90 sealed sources had a label reading, "Caution - Radioactive Material" with symbol. The label did not indicate the kind, quantity or date of assay. The cartons of waste had labels reading, "Caution - Radioactive Materials" with symbol and which indicated the kind, quantity and date of assay. A two curie Co-60 sealed source in storage had a label affixed to the lead pig which read, "Caution - Radioactive Material" with symbol. The label also indicated the kind, quantity and date of assay.

Oakhurst Tower

A 15 mc C-14 sealed light source and two 50 mc Sr-90 sealed light sources in storage at the Oakhurst Tower had labels which read, "Caution - Radioactive Materials" with symbol and which indicated the kind, quantity and date of assay.

Sources in lead pigs were not tagged. Markow stated that sources are not used outside of their storage container. Each lead pig has a device which permits exposure of the source while in the storage container. Form AEC-3 was posted in all restricted areas. The forms were posted at locations to allow observation by employees to and from restricted areas.

18. Personnel Monitoring - Unreported Type "C" Incident

The licensee employs both a weekly and monthly film badge service supplied by the Lexington Ky. Signal Depot. Neutron ring and wrist badges are reportedly used when necessary. 0-200 mr self-reading pocket dosimeters are also used in conjunction with film badges when high level operations are conducted. Dosimeter results are not recorded. It was noted that 75 people are included in the film badge program. Records for the years 1959, 1960 and 1961 were examined and

show the majority of exposures were 0 mrem with the exception of scattered exposures. A previously unreported Type "C" incident under old Part 20 occurred during the week of November 13, 1960 when [redacted] received an exposure as noted by his film badge of 1050 mrem. [redacted] stated that the exposure occurred during one day in the week of November 13, 1960 when he used a 115 c sealed Co-60 source for a planned exposure at the Oakhurst Tower. [redacted] stated that he had calculated he would receive less than 900 mrem during the exposure but he had to loosen a nut on the pig by hand which had jammed, and which resulted in an exposure in excess of the regulations. [redacted] consecutive thirteen week exposure did not exceed 1080 mrem. No report was made to the Commission. A written report was made to the RSO Aldrich, but in accordance with written procedures, no further action was taken by Aldrich.

Ex 6

It was also noted that [redacted] received an 882 mrem gamma whole body exposure during the second calendar quarter from April 2, 1961 to April 29, 1961. [redacted] had been wearing a monthly film badge. [redacted] had been assisting [redacted] in using the 120 c Cs-137 source for instrument calibration and apparently had ignored instructions and had walked into the path of the beam. [redacted] has been removed from all duties involving radiation, effective May 10, 1961. [redacted] second calendar quarter exposure including the first week in May is 894 mrem. The reports of film badge exposures were entered on forms similar to AEC-5 which contained all the required information.

19. Records

Records are maintained of receipt of sources, use, surveys, personnel monitoring, and disposal.

Bottom's Ex 6

M Klevin

E E Epstein

HEADQUARTERS
U. S. ARMY SIGNAL RESEARCH AND DEVELOPMENT LABORATORY
FORT MONMOUTH, NEW JERSEY

IN REPLY REFER TO:
SIGRA/SL- XS
3A-99-20-001-02-02

2 JUN 1961

Mr. Eugene Epstein
U. S. Atomic Energy Commission
New York Operation Office
376 Hudson St.
New York 14, New York

Dear Mr. Epstein:

I am inclosing the information you requested about the liquid disposal system and computations of its activity.

The Hot Lab was first used on 13 April 1953 and the liquid dilution system was used regularly until May 1954. Since then only small trace amounts of material (Sr^{90}, Ag^{110}, Cs^{137}, Cs^{134}) were released into the system (statistically no different than background) except on 19 June 1957 when 1 μc Sr^{90} was washed down the sink.

The 162 cpm in the sink and drain area picked up on our swipe during your inspection is probably creepage from the Sr^{90} spill in September 1953. A decontamination report dated 3 Feb. 1954 is inclosed.

Inclosure 1 is a sample report by R. Rast dated 2 June 1953 with data book calculations.

Inclosure 2 is the decontamination report by Robert Moser mentioned above.

Inclosure 3 is the last page of the log and a sample of the calculations by B. Brown.

Even though it has not been necessary to use the dilution system since 1954, a sample of both liquid and solid waste was assayed in December 1960 to see if creepage could be contaminating the waste from Evans Lab.

Inclosure 4 is a copy of the Dec. 60 Health Physics report with calculations.

Exhibit "A"

SIGRA/SL-XS
3A-99-20-001-02-02

2 JUN 1961

U. S. Atomic Energy Commission

The Hot Lab and Change Room are now closed pending decontamination.

Bldg. 383 (Storage Vault) now has CAUTION RADIOACTIVE MATERIALS signs on all four outside walls and a CAUTION RADIATION AREA and FILM BADGE MUST BE WORN BEYOND THIS POINT on the entrance wall.

Bldg. 401 now has FILM BADGES MUST BE WORN BEYOND THIS POINT in the vestibule. The door to the Isotope Shield has CAUTION - RADIATION AREA and CAUTION - RADIOACTIVE MATERIALS. The far wall of the area beyond the fence in the Isotope Shield has CAUTION - HIGH RADIATION AREA. The door to the X-Ray Shield and the entrance of the maze to the Van de Graaff Generator both have a CAUTION - HIGH RADIATION AREA sign.

The entrance to the Change Room has a CAUTION - RADIATION AREA AND FILM BADGES MUST BE WORN BEYOND THIS POINT. It also has a CAUTION - RADIOACTIVE MATERIALS AND CONTAMINATED AREA sign.

The source containers have CAUTION - RADIOACTIVE MATERIALS with the name of material, activity and date of assay.

The four Victoreen detectors for the alarm system do not contain Co^{60} as I thought but Sr^{90}. They each contain 10μc Sr^{90} Jan. 1961 and are so marked on the CAUTION - RADIOACTIVE MATERIALS sign.

The details of the decontamination procedure will be forwarded to your Office as soon as it is written and prior to decontamination.

Very truly yours,

Basil Markow

BASIL MARKOW
Chairman USASRDA Isotope Committee

4 Incl
1. Sample Rpt
2. Decontamination Rpt
3. Last pg. of Log
4. Dec.60 Health Physics Rpt