



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
631 PARK AVENUE
KING OF PRUSSIA, PENNSYLVANIA 19406

JUN 24 1980

Docket Nos. 30-5980 ✓
30-5982

United States Radium Corporation
ATTN: Mr. J. Miller
Manager, Nuclear Operations
4150 Old Berwick Road
Bloomsburg, Pennsylvania 17815

Gentlemen:

Subject: Combined Inspection 30-5980/80-01; 30-5982/80-01

This refers to the inspection conducted by Mr. F. Costello and Miss P. Verbryke of this office on April 11, 1980 of activities authorized by NRC License Nos. 37-00030-02, -08 and to the discussions of our findings held by Mr. Costello with yourself and other members of your staff at the conclusion of the inspection.

Areas examined during this inspection are described in the Office of Inspection and Enforcement Inspection Report which is enclosed with this letter. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, measurements made by the inspector, and observations by the inspector.

Our inspector also verified the steps you had taken to correct the Items of Non-compliance brought to your attention in a letter dated August 20, 1979. We have no further questions regarding your action at this time.

Based on the results of this inspection, it appears that one of your activities was not conducted in full compliance with NRC requirements, as set forth in the Notice of Violation, enclosed herewith as Appendix A. This item of noncompliance has been categorized into the levels as described in our correspondence to you dated December 31, 1974. This notice is sent to you pursuant to the provisions of Section 2.201 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations. Section 2.201 requires you to submit to this office, within twenty (20) days of your receipt of this notice, a written statement or explanation in reply including: (1) corrective steps which have been taken by you and the results achieved; (2) corrective steps which will be taken to avoid further items of noncompliance; and (3) the date when full compliance will be achieved.

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the enclosures will be placed in the NRC's Public Document Room. If this report contains any information that you (or your contractor) believe to be proprietary, it is necessary

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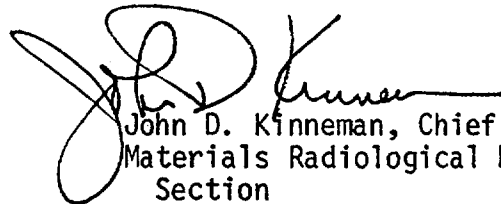
United States Radium
Corporation

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that you make a written application within 20 days to this office to withhold such information from public disclosure. Any such application must be accompanied by an affidavit executed by the owner of the information, which identifies the document or part sought to be withheld, and which contains a statement of reasons which addresses with specificity the items which will be considered by the Commission as listed in subparagraph (b) (4) of Section 2.790. The information sought to be withheld shall be incorporated as far as possible into a separate part of the affidavit. If we do not hear from you in this regard within the specified period, the report will be placed in the Public Document Room.

Should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,



John D. Kinneman, Chief
Materials Radiological Protection
Section

Enclosures:

1. Appendix A, Notice of Violation
2. Office of Inspection and Enforcement Combined
Inspection Report Number 30-5980/80-01; 30-5982/80-01

bcc w/encs:
IE Mail & Files (For Appropriate Distribution)
Central Files
Public Document Room (PDR)
Nuclear Safety Information Center (NSIC)
REG:I Reading Room
Commonwealth of Pennsylvania

APPENDIX A

NOTICE OF VIOLATION

United States Radium Corporation
Bloomsburg, Pennsylvania 17815
License No. 37-00030-02

Docket No. 30-5980

Based on the results of an NRC inspection conducted on April 11, 1980, it appears that one of your activities was not conducted in full compliance with the conditions of your license as indicated below:

License Condition 13 of License No. 37-00030-02 requires that a report of the status and schedule of your decontamination operation for the 12 month period commencing July 1, 1979 be submitted to the NRC no later than July 1, 1979.

Contrary to this requirement, as of the date of the inspection, you failed to submit this report.

This is a deficiency.

U. S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

JUN 20 1980

REGION I

Report No. 80-01
Docket No. 30-5980
30-5982

License No. 37-00030-02, -08 Priority I Category B

Licensee: United States Radium Corporation
4150 Old Berwick Road
Bloomsburg, Pennsylvania 17815

Facility Name: United States Radium Corporation

Inspection At: Bloomsburg, Pennsylvania

Inspection Conducted: April 11, 1980

Inspectors: F. Costello, Radiation Specialist 6/24/80
date
P. Verbryke, Engineering Aide (Co-op) 6/24/80
date

Approved by: John D. Kinneman, Chief, Materials Radio-
logical Protection Section, FF&MS Branch 6/24/80
date

Inspection Summary:

Inspection on April 11, 1980 (Combined Report Number 30-5980/80-01; and 30-5982/80-01)

Areas Inspected: Routine, unannounced inspection including review of previous items of noncompliance, current operations, organization, contamination control, material inventory, bioassay, liquid effluents, stack releases, environmental concentrations of airborne tritium, restricted area concentrations, decontamination operations, and independent measurements. The inspection involved 16 inspector-hours on site by two NRC inspectors.

Results: Of the twelve areas inspected, no items of noncompliance were identified in eleven areas; one apparent item of noncompliance was identified in one area (Deficiency - failure to submit required plan for decontamination, paragraph 11).

DETAILS

1. Persons Contacted

*Mr. J. Miller, Manager, Nuclear Operations
*Mr. J. MacHutchin, Radiation Safety Officer
*Mr. G. Good, Foreman, Health and Safety/Quality Control
Mr. C. Berlin, Group Leader, Health and Safety/Quality Control
Mr. J. Slowick, Group Leader, R-F Tube Manufacturing

* denotes those present at the exit interview

2. Review of Previous Items of Noncompliance

- a. (79-01) - Failure to calibrate ionization chamber used to monitor releases of gaseous tritium. The licensee has used a known source of gaseous tritium to calibrate the effluent monitor.
- b. (79-01) - Failure to report removable contamination in excess of 0.01 microcuries per 100 square centimeters. The licensee has established procedures to ensure that such reports are made promptly.
- c. (79-01) - Failure to submit tritium inventory to Commission. The licensee has submitted the required reports.

3. Current Operations

The only isotope used and distributed is tritium. The licensee continues to manufacture luminescent tubes and sign markers, prepare tritiated foils, and paint watch dials with luminous tritiated paint. The painting of watch dials is performed on an irregular basis.

No items of noncompliance were identified.

4. Organization

There have been several significant changes in the responsibility since the last inspection. Mr. Miller is now the Manager of Nuclear Operations and Mr. MacHutchin replaced Mr. T. Brown as the Radiation Safety Officer on February 26, 1980. Mr. Good has assumed the foreman's position in health physics. Licensee representative stated that a request to change Radiation Safety Officers has been submitted to Materials Licensing.

No items of noncompliance were identified.

5. Contamination Control

The inspectors toured the foil manufacturing, tube manufacturing and watch dial painting facilities. Contamination surveys are performed on a daily basis as required. Records indicated that magenta controlled zones

were maintained below the licensee's 50,000 dpm/100 cm² limit. When contamination in excess of the level was detected, the licensee decontaminated the area.

No items of noncompliance were identified.

6. Material Inventory

The licensee has filed the required statement of tritium inventory with the Department of Energy for 1979. The licensee's inventory indicated that they possessed 35,625 curies of tritium as tritiated gas, foils, paint and liquid.

No items of noncompliance were identified.

7. Bioassay

The licensee representative stated that weekly urinalyses are performed on all individuals working with tritium. The inspectors reviewed the licensee's records for 1979 and 1980, up to the date of the inspection, and determined that no urine specimen had shown more than 10 microcuries per liter. The inspector split employee urine samples with the licensee and analyzed them in the regional office laboratory. The results were consistent with the licensee's analysis.

No items of noncompliance were identified.

8. Liquid Effluents

Liquid wastes are collected in four holdup tanks, analyzed prior to release, and diluted with well water to ensure the concentration does not exceed the maximum permissible concentration. The inspectors reviewed the release records for 1979 and 1980, up to the date of inspection, and determined that the concentration of all releases were within the required limits. 4.91 curies were released as liquid effluent in 1979.

No items of noncompliance were identified.

9. Stack Releases

Stack Sampling for Tritium

The licensee samples for tritium in effluent from an exhaust stack by passing effluent air through a three stage sampling system. The first stage consists of a particulate filter to capture tritium which has become bound to solid particulate matter. The second stage consists of three (3) water columns in series through which the stack sample is passed. The third stage consists of an ionization chamber and electrometer system which continuously monitors the activity in air passing through the first two stages and a desiccant to remove water.

Licensee records indicate that, during 1979, 1.44 curies of tritium were released as particulates, 304 curies tritiated water vapor, and 434 curies as gaseous tritium.

The concentrations of tritium in particulate and gaseous forms were less than 12 percent of maximum permissible concentrations (MPC) in 1979. During the first three months of 1980, the licensee has observed an increase in both particulate and gaseous concentrations of tritium, although well below the applicable MPCs. The licensee is planning to leak test their tritium handling equipment to determine the cause for this increase. The concentrations of tritium released during any month in 1980 have not exceeded 44% of the maximum permissible concentration in the gaseous form.

The concentration of tritium in the form of tritiated water averaged 17 times the value in Appendix B, Table II of Part 20 at the point of release during 1979. During the first three months of 1980, the concentration of tritiated water released has decreased to less than 15 times this value. Licensee calculations of the dilution factors for stack releases indicate ground level concentrations at the site boundary well below the MPCs.

The inspectors split samples with the licensee of the water from the impingers used to determine concentrations of soluble tritium in stack effluent for April 11, 1980. Analysis at the Region I laboratory showed average concentrations of soluble tritium in stack effluent of 2.0×10^{-6} microcuries per milliliter. This is consistent with the licensee's analysis.

No items of noncompliance were identified.

10. Environmental Concentrations of Airborne Tritium

The licensee samples airborne tritium at three locations along the property boundary. The three samples are located along the east property line based on the prevailing westerly winds. The first sample is located on the center line of the prevailing downwind direction from the stack. The other two samples are taken 150 feet north of this center line. These samples are measured for soluble tritium only. As noted above, stack releases are measured to average below Part 20 limits for gaseous and particulate tritium.

Licensee records show that airborne concentration at these points average approximately 2×10^{-9} microcuries per milliliter, one percent of the applicable MPC.

No items of noncompliance were identified.

11. Restricted Area Air Concentrations

The inspectors noted that air monitors were in operation which would alarm when the restricted area MPC is exceeded. Employees told the inspectors that they would immediately leave the area should an alarm sound.

No items of noncompliance were identified.

12. Decontamination Operation

The licensee stated that studies were continuing to evaluate the status of radioactive material which was buried on the property during the 1950's and early 1960's. The licensee plans to expand the environmental monitoring program. No determination has been made with respect to the degree of decontamination that will be attempted.

No report was submitted to the NRC describing the licensee's status and schedule for work for the year beginning July 1, 1979. This finding constitutes noncompliance with License Condition 13 of License Number 37-00030-02.

13. Independent Measurements

The inspectors split samples of water taken from three wells located downstream in the ground waterflow from the buried disposal pits. Samples of this water and water from three residential wells near the property were analyzed for gross beta and alpha activity. The results of the analysis were shown in Attachment A to this report. The results indicate that there has been no change since the last inspection and are consistent with the licensee's results.

Thermoluminescent dosimeters (TLD) were placed at the restricted area boundary to evaluate the external dose rate. These TLDs will be collected in the middle of July 1980.

No items of noncompliance were identified.

14. Exit Interview

The inspectors met with the licensee representatives (denoted in paragraph 1) at the conclusion of the inspection. The inspectors summarized the scope and findings of the inspection.

Attachment AAnalysis of Well Water for Gross
Alpha and Beta Activity

10 milliliter samples of water were evaporated to dryness and counted for 10 minutes for alpha and beta activity at the Region I counting laboratory using a Tennelec LB 1000 Low Background Counting System.

<u>Sample Identification</u>	<u>Gross Alpha Activity $\mu\text{Ci/ml}$</u>	<u>Gross Beta Activity $\mu\text{Ci/ml}$</u>	<u>Tritium $\mu\text{Ci/ml}$</u>
1. U.S. Radium Well B1	<MDA (1)	$(7.8 \pm 0.3) \times 10^{-5}$	$(2.29 \pm .06) \times 10^{-5}$ (2)
2. U.S. Radium Well B2	<MDA	$(4.7 \pm 0.2) \times 10^{-5}$	$(1.24 \pm .04) \times 10^{-5}$ (2)
3. U.S. Radium Well B3	<MDA	$(5.9 \pm 0.8) \times 10^{-6}$	$(1.39 \pm .04) \times 10^{-5}$ (2)
4. Residential (2) Well 1	$(9 \pm 4) \times 10^{-10}$	$(1.1 \pm 0.8) \times 10^{-8}$	$(6.5 \pm 4.0) \times 10^{-6}$
5. Residential (2) Well 2	$(8 \pm 5) \times 10^{-10}$	$(1.2 \pm 0.8) \times 10^{-8}$	$(2.0 \pm 4.0) \times 10^{-6}$
6. Residential (2) Well 3	$(4 \pm 4) \times 10^{-10}$	$(1.1 \pm 0.8) \times 10^{-8}$	$(0.5 \pm 4.0) \times 10^{-6}$

(1) Minimum Detectable Activity (MDA) for 10 minute count of 10 milliliter sample with 0.2 counts per minute alpha background = 7×10^{-10} microcuries/milliliter

(2) Performed by Idaho National Laboratory

Maximum Permissible Concentrations

Sr-90 (assumed beta isotope): 3×10^{-7} microcuries/milliliter

Radium-226 (assumed alpha isotope): 3×10^{-8} microcuries/milliliter

Tritium: 3×10^{-3} microcuries/milliliter