

OCT 22 1985

Docket Nos. 30-5981
30-5982
30-5335
30-8444
11-03197

License No. 37-00030-07E
~~37-00030-08~~ ✓
37-00030-09G
37-00030-10G
XB-001183

Safety Light Corporation
ATTN: Mr. Jack Miller
President
4150-A Old Berwick Road
Bloomsburg, Pennsylvania 17815

Gentlemen:

Subject: Inspection Report No. 85-01

This refers to the routine safety inspection conducted by Mrs. Teresa Hall Darden of this office on June 18-20, 1985 of activities authorized by NRC License Nos. 37-00030-07E, 37-00030-08, 37-00030-09G, 37-00030-10G and XB-001183 and to the discussions of our findings held by Mrs. Darden with yourself and Messrs. Watts, Fritz, Harmon, MacHutchin and Berlin of your staff at the conclusion of the inspection.

The inspection was an examination of activities conducted under your license as they relate to radiation safety and to compliance with the Commission's rules and regulations and the conditions of your licenses. 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 have taken to correct the violation brought to your attention in the enclosure to our letter dated September 22, 1983. We have no further questions regarding your action at this time.

Within the scope of this inspection, no violations were observed.

Our inspector also split bioassay samples and wipes for contamination that were analyzed in our Regional Office laboratory. The basic purpose of these independent measurements was to verify your capability to evaluate the presence of loose radioactivity in your facility. The results of our independent analysis are in agreement with your results.

In accordance with 10 CFR 2.790(a), a copy of this letter and the enclosure will be placed in the NRC Public Document Room.

OFFICIAL RECORD COPY

DL SAFETY LIGHT - 0001.0.0
08/15/85

IE:07

Safety Light Corporation

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OCT 22 1985

No reply to this letter is required. Your cooperation with us in this matter is appreciated.

Sincerely,

Original Signed By:

John D. Kinneman

John D. Kinneman, Chief
Nuclear Materials Safety Section A,
Division of Radiation Safety
and Safeguards

Enclosure: NRC Region I Inspection Report Number 85-01

cc w/encl:

Public Document Room (PDR)

Nuclear Safety Information Center (NSIC)

Commonwealth of Pennsylvania

Mr. John MacHutchin, RSO

bcc w/encl:

Region I Docket Room (w/concurrences)

Operations Support Officer (w/o encl)

T. Darden

RI:DRSS
Darden/gcb
10/8/85

RI:DRSS
Kinneman
10/8/85

~~RI:DRSS
Joyner~~

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DL SAFETY LIGHT - 0002.0.0
08/15/85

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report Nos. 30-5981/85-01
30-5982/85-01
30-5335/85-01
30-8444/85-01
11-03197/85-01

Docket Nos. 30-5981
30-5982
30-5335
30-8444
11-03197

License Nos. 37-00030-07E Priority 1 Category B
37-00030-08
37-00030-09G
37-00030-10G
XB-001183

Licensee: Safety Light Corporation
4150-A Old Berwick Road
Bloomsburg, Pennsylvania 17815

Facility Name: Safety Light Corporation

Inspection At: Bloomsburg, Pennsylvania

Inspection Conducted: June 18-20, 1985

Inspectors: Teresa Hall Darden
Teresa Hall Darden, Health Physicist

10/23/85
date

Approved by: John D. Kinneman
John D. Kinneman, Chief, Nuclear Materials
Section A

10/23/85
date

Inspection Summary:

Inspection conducted June 18-20, 1985 (Report Nos. 30-5981/85-01;
30-5982/85-01; 30-5335/85-01, 30-8444/85-01 and 11-3197/85-01

Areas Inspected: Routine unannounced inspection, including review of scope of current operations, organization, contamination control, training, bioassay, stack releases, restricted area air concentrations, package surveys, solid waste disposal, radiation safety committee meetings, material inventory, and quality assurance.

Results: No violations were identified.

DETAILS

1. Persons Contacted

- *Mr. J. Miller, President
- *Mr. J. Watts, Vice President
- *Mr. J. MacHutchin, Radiation Safety Officer
- *Mr. C. Berlin, Lead Radiation Safety Technician
- *Mr. N. Fritz, Production Engineer
- Mr. L. Harmon, Production Manager
- Ms. M. Hippenstle, Technician
- Mr. J. Smith, Technician

*denotes those present at the exit interview.

2. Review of Previous Items of Noncompliance

Failure to conduct daily smears in magenta areas during periods of production activity. Records reviewed during the inspection indicate that this item is corrected.

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 violations were identified.

4. Organization

There has been no significant changes in the organization since the last inspection.

No violations were identified.

5. Contamination Control

The inspector 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/100cm² limit. When contamination in excess of the level is detected, the licensee decontaminates the area.

Along with the licensee representative the inspector took 15 swipes from the active processing areas. The licensee assayed each of these samples before the inspector left the site on the day of the inspection. NRC independent analysis of these swipes at NRC Region I counting facilities indicate that the licensee's results were consistent with the Regional analysis considering differences in counting geometry and equipment.

No violations were identified.

6. Training

The inspector interviewed a technician who operates the gas fill system. She had been employed in that position for approximately 8 weeks. She stated that she had been instructed in the principles of radiation protection by the Health Physics staff. She also stated that she had spent approximately four weeks observing operation of the gas fill system and operating it under supervision before she was allowed to operate it without direct supervision. This individual appeared to be knowledgeable in the licensed procedures and NRC requirements.

The inspector also reviewed the records of annual retraining.

No violations were observed.

7. Bioassay

The licensee representative stated that weekly urinalyses are performed on all individuals working with tritium. The inspector reviewed the licensee's records for 1983, 1984 and 1985, up to the date of the inspection, and determined that no urine specimen had shown more than 7 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 considering differences in counting geometry and equipment.

No violations were identified.

8. Stack Releases

All building exhausts are combined for discharge through a single stack, 0.6m in diameter and 18m high. Continuous monitoring of this stack for particulate, aqueous and gaseous forms of tritium is performed using filters and ethylene glycol bubblers in conjunction with an oxidizer furnace. Filters and ethylene glycol solutions are changed and analyzed daily. The licensee has determined diffusion factors for the exhaust stream under predominant meteorological conditions (wind toward the southeast) and utilizes these factors to calculate the concentration released to unrestricted areas.

Operations involving possible airborne releases are performed under exhaust ventilation. Silica gel (indicating-type) columns and molecular sieve back-up columns are used for treatment of gas streams with potentially high concentrations of tritium. These are replaced when needed as determined by observation of the silica gel. The old columns are disposed of as solid waste.

Licensee records indicate that during 1983, 0.1 curies of tritium were released as particulates, 174 curies as tritiated water vapor, and 2302 curies as gaseous tritium; during 1984, 0.1 curies of tritium were released as particulates, 142 curies as tritiated water vapor, and 2050 curies as gaseous tritium.

The concentrations of tritium in particulate and gaseous forms were less than 65 percent of maximum permissible concentrations (MPC) found in Appendix B, Table II of 10 CFR Part 20 in 1983 and less than 57 percent in 1984.

The concentration of tritium in the form of tritiated water averaged 9.8 times MPC in 1983 and 7.9 times MPC in 1984. Licensee calculations of the dilution factors for stack releases indicate ground level concentrations at the site boundary are well below the MPC for release.

Licensee measurements of stack effluents at the point of release for unrestricted areas and environmental offsite air sampling were verified in a report by Oak Ridge Associated Universities, dated November 1982. The contractors concluded that the environmental tritium monitoring and control program established by Safety Light Corporation was adequate.

One significant stack release totalling 148 curies of tritium over an 8 hour period on February 20, 1985 as a result of an accidental releases from the gas fill system, was reviewed by the inspector. Licensee calculations indicate that the average ground level concentration of tritium at approximately 125 meters downwind from the stack was 1.8×10^{-6} $\mu\text{Ci/ml}$ of air, or about $0.05 \times \text{MPC}$ (MPC for unrestricted area for $^3\text{H}_{\text{sub}}$ being $4 \times 10^{-5} \mu\text{Ci/ml}$). The licensee documented from independent measurements over 12 months from the Environmental Sampling System that it was appropriate to perform calculations assuming submersion conditions versus soluble tritium limits since the conversion of tritium to tritiated water is not complete at this point. Based on data review of licensee evaluation of the incidence, the inspector agreed with the licensee's calculation of the release and compliance with regulatory limits.

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 were 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 averaged approximately 10^{-9} microcuries per milliliter, less than one percent of the applicable MPC.

No violations were identified.

9. Restricted Area Air Concentrations

The inspector 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.

On the day of inspection, the scrubber system alarm setting was 1000 $\mu\text{Ci}/\text{m}^3$, the fill hood system alarm setting was 100 $\mu\text{Ci}/\text{m}^3$, and the general air alarm in the room was set at 10 $\mu\text{Ci}/\text{m}^3$.

No violations were identified.

10. Package Surveys

The inspectors reviewed the records of surveys of incoming and outgoing packages. All packages are surveyed prior to leaving the gas filled room and results are recorded prior to shipment.

No violations were identified.

11. Solid Waste Disposal

The licensee has not made a shipment of radioactive waste to an authorized burial site since December of 1982. This was reviewed during the last inspection. Presently, the licensee is storing 14,123 curies of ^3H waste.

No violations were identified.

12. Radiation Safety Committee Meetings

The minutes from Radiation Safety Committee meetings were reviewed by the inspector. The inspector noted that on those occasions where the contamination levels exceeded 50,000 dpm/100cm² that immediate decontamination efforts were initiated and continued until repeat wipe surveys indicated removable contamination levels of less than 50,000 dpm/100cm².

Records indicated that the Radiation Safety Committee was informed of any instances of high levels of contamination and subsequent decontamination activities by the Radiation Safety Office.

No violations were identified.

13. Material Inventory

The licensee's inventory indicated that they possessed 78,000 curies of tritium as tritiated gas, foils, paint and liquid on the day of inspection. The licensee has filed the required statement of tritium inventory with the U. S. Energy Research and Development Department at Oak Ridge, Tennessee for 1984 and thru March 1985.

14. Quality Assurance

The inspector reviewed the procedures used to test gas-filled products to assure adequacy of the tritium seals. The procedure includes visual inspection and wipe tests of all individual tubes of gas. The completed units are placed in a chamber whose air is monitored for tritium to detect any leakage.

No violations were identified.

15. Exit Interview

The inspector met with the licensee representatives denoted in paragraph 1 at the conclusion of the inspection. The scope and findings of the inspection were summarized.