

JUL 11 1990

Docket Nos. 030-05980  
030-05981  
030-05982  
030-08335  
030-08444

License Nos. 37-00030-02  
37-00030-07E  
37-00030-08  
37-00030-09G  
37-00030-10G

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

Gentlemen:

Subject: Routine Inspection No. 90-001

On March 19-20, 1990, Francis M. Costello, of this office conducted a routine safety inspection at the above address of activities authorized by the above listed NRC license. The inspection was an examination of your licensed activities as they relate to radiation safety and to compliance with the Commission's regulations and the license conditions. The inspection consisted of observations by the inspector, interviews with personnel, and a selective examination of representative records. The findings of the inspection were discussed with Norman Fritz of your staff at the conclusion of the inspection. A copy of the NRC inspection report is enclosed.

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 enclosure will be placed in the Public Document Room.

Your cooperation with us is appreciated.

Sincerely,

**Original Signed By:**  
**John D. Kinneman**

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

9007230114 900711  
REG1 LIC30  
37-00030-02 PDC

OFFICIAL RECORD COPY

IR SAFETY LIGHT/2 - 0001.0.0  
06/06/90

Return Original to Region I : 1507

Enclosure:

Combined Inspection Nos. 030-05980/90-001, 030-05981/90-001,  
030-05982/90-001, 030-08335/90-001 and 030-8444/90-001

cc:

Public Document Room (PDR)  
Nuclear Safety Information Center (NSIC)  
Commonwealth of Pennsylvania  
Norman Fritz, Radiation Safety Officer

USR Industries, Inc.


ATTN: Mr. Ralph T. McElvenny  
Chairman and Chief Executive Officer  
550 Post Oak Boulevard  
Suite 550  
Houston, Texas 777027

bcc:

Region I Docket Room (w/concurrences)  
Management Assistant, DRMA  
F. Costello, RI  
G. Sjoblom, NMSS  
M. Knapp, RI  
J. Joyner, RI  
D. Holody, RI  
J. Kinneman, RI  
J. Lieberman, OE  
J. Greeves, RI  
P. Vacca, NMSS

 RI:DRSS  
Costello/bj

06/10/90

 RI:DRSS  
Kinneman

06/10/90

OFFICIAL RECORD COPY

IR SAFETY LIGHT/2 - 0002.0.0  
06/06/90

U.S. NUCLEAR REGULATORY COMMISSION  
REGION I

Report Nos. 030-05980/90-001  
030-05981/90-001  
030-05982/90-001  
030-08335/90-001  
030-08444/90-001

Docket Nos. 030-05982  
030-05981  
030-05980  
030-08335  
030-08444

License Nos.	<u>37-00030-08</u>	Priority	<u>1</u>	Category	<u>B</u>
	<u>37-00030-02</u>		<u>3</u>		<u>E</u>
	<u>37-00030-07E</u>		<u>5</u>		<u>E</u>
	<u>37-00030-09G</u>		<u>4</u>		<u>E</u>
	<u>37-00030-10G</u>		<u>4</u>		<u>E</u>

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

Facility Name: Safety Light Corporation

Inspection At: Bloomsburg, Pennsylvania

Inspection Conducted: March 19-20, 1990

Inspectors: Francis M. Costello 7/10/90  
Francis M. Costello date  
Senior Health Physicist

Approved by: John D. Kinneman 7/10/90  
John D. Kinneman, Chief date  
Nuclear Materials Safety Section B

Inspection Summary: Inspection conducted March 19, 1990 (Combined Report Nos. 030-05980/90-001, 030-05982/90-001, 030-05981/90-001, 030-08335/90-001, and 030-08444/90-001)

Areas Inspected: Routine, unannounced inspection, including review of status of licensed activities, bioassay, radioactive waste inventory and environmental sampling.

Results: No violations were identified with respect to License Nos. 37-00030-08, 37-00030-07E, 37-00030-08G, 37-00030-10G. With respect to License No. 37-00030-02, the apparent violations identified in Inspection No. 030-05980/86-001 apparently had not been corrected.

## DETAILS

### 1. Persons Contacted

- \*Norman Fritz, Radiation Safety Officer
- \*Jerry Slowick, Production Manager
- \*John MacHutchin - Consultant
- \*Charles Berlin - Radiation Safety Technician
- Dolly Griffin - Gas Fill Operator
- Martha Lawbone, Gas Fill Supervisor
- \*Richard Hartman - Private Individual

\*Present at exit interview

### 2. Scope of Licensed Activities

Safety Light Corporation is authorized by NRC License Nos. 37-00030-08, 37-00030-07E, 37-00030-09G and 37-00030-10G to possess and use any form of hydrogen-3 for research and development, manufacturing, and general and exempt distribution of various products and any byproduct material as sealed sources for use as reference standards. The licensee's current operations include the manufacturing and distribution of luminescent signs, gas chromatograph foils and accelerator targets.

Safety Light Corporation is also authorized by NRC License No. 37-00030-02 to possess any product material as contaminated equipment and facilities for the decontamination, cleanup, and disposal of such material. No current decontamination activities are being conducted under this license. The failure to perform decontamination activities was cited as an apparent violation in NRC Inspection Report No. 030-5980/86-001. This apparent violation has not been corrected. The licensee is continuing to monitor water from bore holes on site and at the perimeter of the licensee's property to evaluate the status of radioactive material that was buried on the property during the 1950's and 1960's. Analysis is performed for the licensee by a contractor.

### 3. Tour of Grounds

The inspector toured the grounds around the Safety Light facility, accompanied by licensee personnel and Richard Hartman, an individual who, as a child, had lived in the house on the eastern boundary of the site in the early 1950's. Mr. Hartman had offered to identify locations on the site where luminous paint had been buried in the past. Mr. Hartman stated that he lived there from 1944 to 1954 and used to find small plastic containers with paste inside which glowed in the dark. The licensee's radiation safety consultant, Dr. John MacHuthin looked at a catalogue of products from that time period and, based on Mr. Hartman's description, suggested that these small containers were deck markers containing approximately 20 microcuries of radium-226 or, less likely, 400 to 500 microcuries of strontium-90. Mr. Hartman said that these "deck markers" were in the old canal near the river in large numbers and that he and his friends threw a large number of them into the Susquehanna River. However, during the tour, no "deck markers" or other radioactive materials were observed.

The old canal was filled in during the late 1950's according to licensee representatives. The inspector also performed a survey of Mr. Hartman's former residence which is now unoccupied and owned by the licensee. The survey with a Ludlum Micro-R meter identified no areas in excess of natural background, approximately ten microrem per hour.

#### 4. Environmental Sampling

The inspector reviewed bore hole and well water sampling results. It was noted that analyses of on-site subsurface water continue to indicate concentrations of radioactive material in excess of limits for unrestricted areas. The principal isotopes in the subsurface water are strontium-90, radium-226, and tritium.

The licensee also continues to sample drinking water from wells on the properties of nearby residences. The tritium concentration in these samples has been measured to be less than the EPA standard of 20,000 picocuries per liter for tritium in drinking water. Typical measurements vary from 1,000 to 9,000 picocuries per liter. The licensee's minimum detectable concentration for these analysis is approximately 1,000 picocuries per liter. These samples are taken from the nearby residences on a monthly basis.

The most recent results of the licensee's analysis of subsurface water samples are included in Attachment 1 to this report. The locations of these samples are indicated in the map in Attachment 2 to this report. The results of these analyses indicate that there are a number of onsite samples which exceed NRC limits for water released to unrestricted areas and a larger number of samples which exceed the EPA drinking water samples. This analysis assumes that gross alpha activity is radium-226 and the gross beta activity is strontium-90.

No violations were identified.

#### 5. Bioassays

A licensee representative stated that weekly urinalyses are performed on all individuals working with tritium. The inspector reviewed the licensee's bioassay records for the previous year and determined that the maximum individual urine sample contained 9.68 microcuries of tritium per liter.

No violations were identified.

#### 6. Radioactive Waste Inventory

Licensee records indicated that the current inventory of radioactive waste on site is approximately 6,350 curies, which is within the license limit of 35,000 curies. The licensee also possesses approximately 7,800 curies of tritium in signs returned from customers. The licensee's inventory of tritium for use in manufacturing is approximately 63,190 curies.

No violations were identified.

7. Routine Surveys

The inspector reviewed the records of the licensee's routine surveys of the tritium production facility. He noted that these surveys have been performed at the frequencies required by the license application and that the licensee had taken prompt corrective actions when contamination levels in excess of its action limits were identified. The inspector also determined that the inventory and leak-testing of sealed sources had been performed or required.

No violations were identified.

8. Liquid Waste Releases

The inspector reviewed the records of the licensee's releases of liquid waste to the Susquehanna River. The licensee samples each batch before release and the release is diluted with well water prior to discharge. The licensee released 1.3 curies of tritium to the Susquehanna River during 1989 with an average concentration of 2.06 E-3 microcuries per milliliter. The 10 CFR 20.106 limit for releases of water to unrestricted areas is 3 E-3 microcuries per milliliter.

No violations were identified.

9. Airborne 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. The 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 of tritium released to unrestricted areas.

Licensee records indicate that, during 1989, 241.8 curies of tritium were released as tritiated water vapor and 6,626.9 curies were released as gaseous tritium. The licensee's summary of releases are included as Attachment 2. Using previously determined diffusion factors, the licensee determined that the concentration of tritium released to the unrestricted area was within the limits in 10 CFR 20.106.

The licensee experienced a greater number of leaking tubes, and resulting higher releases, during the first quarter of 1989. Licensee representatives stated that production problems in the manufacturing of tubes for export to China, "China markers", resulted in the higher releases. During the first quarter of 1989, there were 113 curies of tritium released as tritiated water vapor and 4,152 curies of tritium released as gaseous tritium.

No violations were identified.

10. Training

No new production employees had been hired in the previous two years. The inspector interviewed the two individuals who work in the production area and determined that they were familiar with the licensee's operating and emergency procedures.

The inspector also interviewed two individuals who work at the site for USR Multimetals. The workers had been provided formal radiation safety training by the licensee.

No violations were identified.

6. Exit Interview

The inspector and other NRC staff met with the individuals identified in Paragraph 1 at the conclusion of the inspection. The scope and findings of the inspection were summarized.

Attachment 1

Combined Inspection Report Nos. 030-05980/90-001, 030-05982/90-001,  
030-05981/90-001, 030-08385/90-001 and 030-08444/90-001

Most Recent Licensee Analyses of Subsurface Water Samples



Attachment 1

Most Recent Licensee Analyses of Subsurface Water Samples

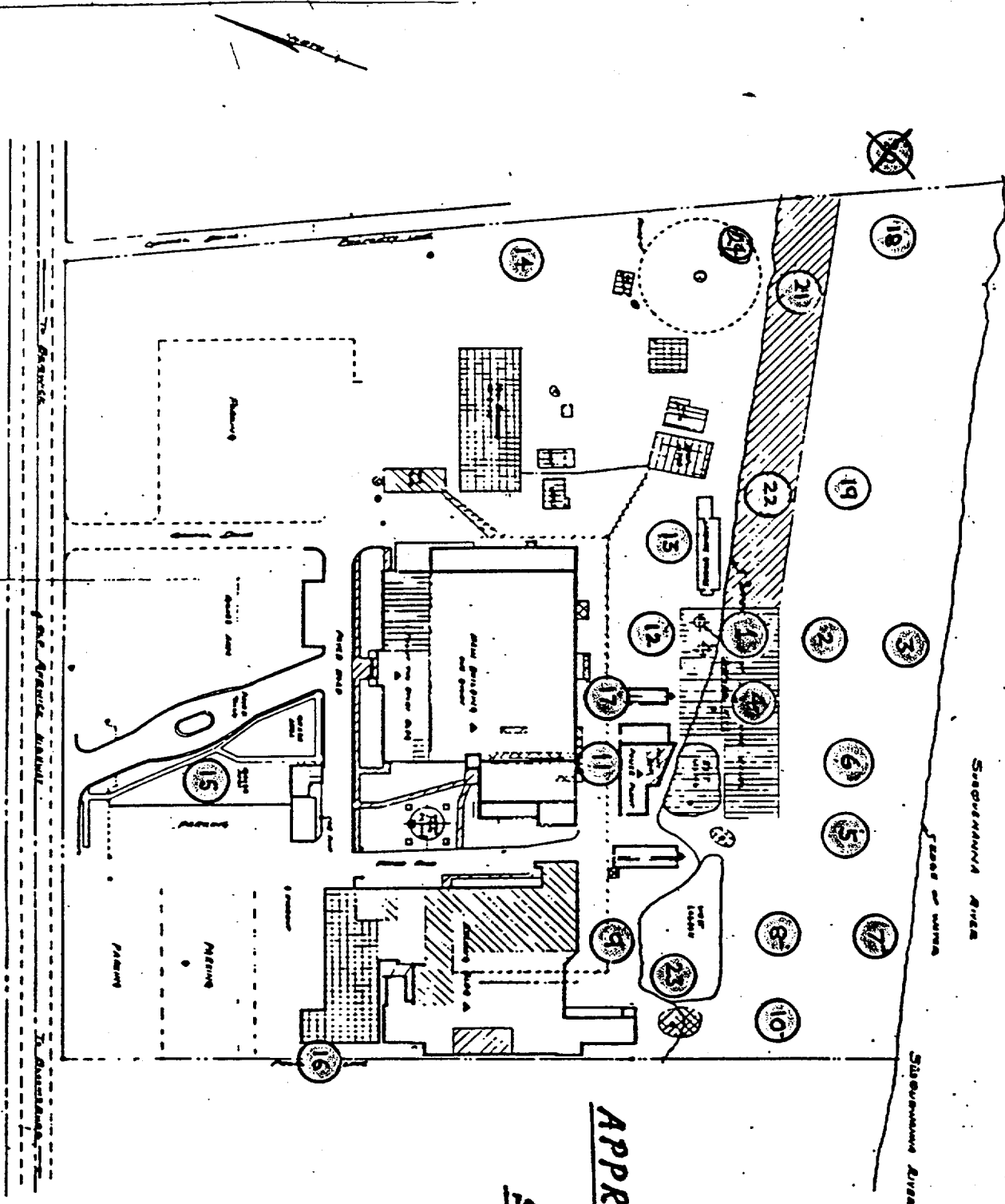
<u>Sample</u>	<u>Gross Alpha</u>	<u>Gross Beta</u>	<u>Sample Depth (feet)</u>
NRC			
Unrestricted			
Area Limit	30 (Ra-226)	300 (Sr-90)	
EPA Drinking			
Water Limit	5 (Ra-226)	8 (Sr-90)	
Eastern			
Residential	<0.5	2	
Western			
Residential	<0.6	2	
East Lagoon	1.9	4.1	
Bore 1	<10	4,500	24
Bore 2	<10	8,500	24
Bore 3	<9	920	24
Bore 4	<0.6	39	20
Bore 5	9	15	20
Bore 6	<1	610	20
Bore 7	0.9	25	20
Bore 8	<1	26	20
Bore 9	<0.7	21	30
Bore 10	<0.6	39	20
Bore 13	<1	7	37
Bore 14	<0.2	2	30
Bore 15	<1	<6	30
Bore 16	<0.3	<0.7	35
Bore 18	<0.5	30	35
Bore 19	<0.3	267	20
Bore 21	5	1,000	35
Bore 22	275	3,400	6

Concentrations are in picocuries per liter

Attachment 2

Combined Inspection Report Nos. 030-05980/90-001, 030-05982/90-001,  
030-05981/90-001, 030-08335/90-001, and 030-08444/90-001

Locations of Onsite Bore Holes



APPROXIMATE LOCATION

OF SHALLOW BORE HOLES

C/B/JEM  
4/81

ONE METRE

<b>UNITED STATES MARINE CORPS</b> 3rd Marine Amphibious Brigade 3rd Marine Landing Helicopter Battalion Camp Pendleton, California 1981		DATE 4/81
PROJECT Borehole Locations		DRAWN BY JEM
CHECKED BY C/B		SCALE 1:1000
APPROVED BY [Signature]		SHEET NO. 1
TITLE Borehole Locations		PROJECT NO. [Blank]