

MAR 11 1991

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. 91-001

On January 22-23, 1991, 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 you and members of your staff at the conclusion of the inspection. A copy of the NRC inspection report is enclosed.

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

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 will be placed in the Public Document Room. No reply to this letter is required.

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

OFFICIAL RECORD COPY

IR SAFETY LIGHT - 0001.0.0
03/04/91

9104010248 910311
REG1 LIC30
37-00030-02 PDR

RETURN ORIGINAL TO
REGION 1

IE:

Safety Light Corporation

2

Enclosure:

Combined Inspection Nos. 030-05980/91-001, 030-05981/91-001,
030-05982/91-001, 030-08335/91-001 and 030-8444/91-001

cc:

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

USR Industries, Incorporated
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
P. Vacca, NMSS

FMC
RI:DRSS
Costello/bj

RI:DRSS
Kinneman

03/6/91

03/6/91

OFFICIAL RECORD COPY

IR SAFETY LIGHT - 0002.0.0
03/04/91

U. S. NUCLEAR REGULATORY COMMISSION
REGION I

Report Nos. 030-05980/91-001
030-05981/91-001
030-05982/91-001
030-08335/91-001
030-08444/91-001

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

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

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

Facility Name: Safety Light Corporation

Inspection At: Bloomsburg, Pennsylvania

Inspection Conducted: January 22-23, 1991

Inspector:

Francis M. Costello

Francis M. Costello,
Senior Health Physicist

3/6/91
date

Approved by:

John D. Kinnehan
John D. Kinnehan, Chief
Nuclear Materials Safety Section B

3/6/91
date

Inspection Summary: Inspection conducted January 22-23, 1991 (Combined Report Nos. 030-05980/91-001, 030-05982/91-001, 030-05981/91-001, 030-08335/91-001 and 030-08444/91-001)

Areas Inspected: Routine, unannounced inspection, including review of status of licensed activities, environmental sampling, bioassays, radioactive material inventory, routine surveys, airborne releases, and an evaluation of previous 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 No. 030-05980/86-001 apparently had not been corrected.

DETAILS

1. Persons Contacted

- *Jack Miller - President
- *Norman Fritz, Radiation Safety Officer
- Jerry Slowick - Production Manager
- John MacHutchin - Consultant
- Charles Berlin - Radiation Safety Technician

*Present at exit interview

2. Status 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. There was no distribution under License No. 37-00030-07E in 1990. The licensee's current operations include the manufacturing and distribution of luminescent signs and markers, gas chromatograph foils and accelerator targets. In December 1990, the licensee shipped one of its two rotary tube-filling machines to Shield Source, Inc. in Peterborough, Ontario, Canada. These machines are used to fill tubes with tritium for use in the manufacture of luminescent exit signs.

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. 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 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 during 1990 vary from 3,000 to 13,000 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.

The licensee also performs air sampling using impingers at nearby residences. Typical measured concentrations range from 0.2-1.3 E-9 microcuries per cubic centimeter. The NRC limit for tritium in air in unrestricted areas is 2 E-7 microcuries per cubic centimeter.

No violations were identified.

4. 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 13.31 microcuries of tritium per liter. This value is less than the excretion rate which would be expected from an exposure for 40 hours at the NRC occupational concentration limit (10 CFR 20, Appendix B, Table I, Column 1).

No violations were identified.

5. Radioactive Material Inventory

The licensee receives 10,000 curie shipments of tritium approximately every three weeks. The shipments originate at the Department of Energy Oak Ridge National Laboratory. The shipments are sent to the Department of Energy Mound Laboratory to determine the radioactivity content before arriving at the licensee. The most recent shipment arrived on January 11, 1991. Licensee records indicated that the current inventory of radioactive material on site is approximately 58,528 curies, which is within the license limit of 350,000 curies. The licensee's inventory includes approximately 5,257 curies as waste in the form of silica gel columns in metal cans (2,444 curies), tube stubs and leaking tubes in metal cans (1,452 curies), a 55-gallon drum containing leaking wands and signs (932 curies), two boxes of signs returned from customers (400 curies), and 60 two-gallon cans of tube stubs (0.48 curies).

The inspector determined that since November, 1990, the licensee sent for disposal, 17,892 curies of tritium, in returned customers signs, to Shield Service, Inc. in Peterborough, Ontario, Canada. The inspector also determined that the licensee made 13 shipments of other radioactive waste to the Hartford, Washington facility in 1990.

No violations were identified.

6. 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.

No violations were identified.

7. 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 1990, 209 curies of tritium were released as tritiated water vapor and 7,775 curies were released as gaseous tritium. The licensee's summary of releases are included as Attachment 3. 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 performs air sampling at the site boundary using impingers. The measured concentrations were in the range 0.2-6.5 E-9 microcuries per cubic centimeter in 1990. The NRC limit for tritium in air released to unrestricted areas is 2 E-7 microcuries per cubic centimeter.

No violations were identified.

8. Evaluation of Previous Sampling

In August 1990, the licensee provided the NRC with water samples from each of its onsite bore holes and also from the sampling wells installed by Chem Nuclear during its sampling program in the summer of 1990. The results of the Department of Energy Radiological and Environmental Laboratory analyses of these samples are provided in Attachment 4. These results are consistent with licensee monitoring.

9. 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. 030-05980/91-001, 030-05982/91-001,
030-05981/91-001, 030-08385/91-001 and 030-08444/91-001

Most Recent Licensee Analyses of Subsurface Water Samples

Attachment 1

Most Recent Licensee Analyses of Subsurface Water Samples

<u>Sample</u>	<u>Date</u>	<u>Gross Beta</u> (picocuries per liter)
NRC Unrestricted Area Limit		300 (Sr-90)
EPA Drinking Water Limit		8 (Sr-90)
Eastern Residential	December 1990	3 ± 1
Western Residential	December 1990	3 ± 1
East Lagoon	August 1990	15 ± 2
Bore 1	December 1990	15,300 ± 300
Bore 2	December 1990	8,900 ± 300
Bore 3	December 1990	1,320 ± 100
Bore 4	October 1990	105 ± 3
Bore 5	November 1990	41 ± 8
Bore 6	November 1990	1,436 ± 14
Bore 7	November 1990	36 ± 2
Bore 8	January 1990	26 ± 4
Bore 9	October 1990	21 ± 3
Bore 10	February 1990	39 ± 3
Bore 12	September 1990	26 ± 2
Bore 13	September 1990	139 ± 5
Bore 14	March 1990	0.1 ± 0.5
Bore 15	July 1990	2 ± 3
Bore 16	April 1990	2 ± 2
Bore 18	August 1990	30 ± 2
Bore 19	June 1990	92 ± 3
Bore 21	May 1990	1,103 ± 12
Bore 22	August 1990	2,390 ± 20
Bore 23	May 1990	15 ± 1

Attachment 2

Combined Inspection Report Nos. 030-05980/91-001, 030-05982/91-001,
030-05981/91-001, 030-08335/91-001, and 030-08444/91-001

Location of Onsite Bore Holes

FIGURE 1.
LOCATION
MAP

USQUEHANNA RIVER

OLD BERWICK ROAD

SAFETY LIGHT CORPORATION

MAIN PROCESS BUILDING

TANK

STACK

SILOS

EAST LAGOON

WEST LAGOON

PIT

APPROXIMATE LOCATION OF ABANDONED CANAL

VANCE/WALTON PROPERTY

VANCE PROPERTY

V/W WELL

MONITORING WELLS: A, B, C, D, E, F, G, H, I, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 14, 15, 16, 17, 18, 19, 20, 21, 23, 24

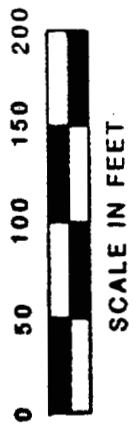
EXPLANATION

9. LOCATION AND DESIGNATION OF MONITORING WELL

SCALE IN FEET

0 50 100 150 200

9. LOCATION AND DESIGNATION
OF MONITORING WELL



LORES DATA

DATE	DEPTH	DEPTH TO WATER	CONTRACTOR	REMARKS
10-10-78	24'	10' - 10"	GILES DRILLING	T.B.
10-11-78	24'	6' - 5"	GILES DRILLING	T.B.
10-12-78	24'	4' - 4"	GILES DRILLING	T.B.
2-22-79	20'	4' - 6"	UNITER CORP.	E.M.
2-20-79	20'	6' - 5"	UNITER CORP.	E.M.
2-21-79	20'	2' - 4"	UNITER CORP.	E.M.
2-14-79	20'	8' - 6"	UNITER CORP.	E.M.
2-20-79	20'	7'	UNITER CORP.	E.M.
2-21-79	30'	19'	WILANO CO.	E.M.
2-14-79	20'	7' - 6"	UNITER CORP.	E.M.
3-2-79	30'	14'	WILANO CO.	E.M.
3-1-79	30'	23'	WILANO CO.	E.M.
2-20-79	30'	14'	WILANO CO.	E.M.
2-15-79	30'	18'	WILANO CO.	E.M.
2-15-79	35'	26'	WILANO CO.	E.M.
2-14-79	35'	26'	WILANO CO.	E.M.
1945	60'	13'	WILANO CO.	E.M.
2-27-79	20'	6'	WILANO CO.	E.M.
2-27-79	18'	5'	WILANO CO.	E.M.
8-22-79	6'	6'	WESTON CO.	K.S.
8-22-79	15'	7' - 6"	STACKHOUSE	K.S.
8-22-79	12'	9' - 6"	STACKHOUSE	K.S.
8-22-79	27'	11'	STACKHOUSE	K.S.

14/89
 Per C. Berlin, this date last collection, all Lores within the creek with metal at bottom were used to the bottom of the Lores. C.B. recalls no Lores used on any Loring. Rose 20 was a sloping fit, i.e., obviously water could run down bottom casing and that of Lores.

Attachment 3

Combined Inspection Report Nos. 030-05980/91-001, 030-05982/91-001,
030-05981/91-001, 030-08385/91-001 and 030-08444/91-001

Licensee Record of Tritium Processed and Released

COMPARISON - PROCESSED VS. RELEASED VS. ENVIRONMENTAL - BY QUARTER

HR-QTR	PROCESSED				RELEASED										NO. IMPREGS	NO. TUBES RUN	C.I. PER TUBE	UNUSUAL RELEASES	BIO-ASSAY-AVG. PER-ALL WELLS	TOTAL P.C.I./L *
	C.I. STATIC	C.I. ROT. I	C.I. ROT. II	C.I. F.T	CURIES	LEAKERS	C.I. TOTAL	C.I. 3H(I)	C.I. 3H(S)	C.I. 3H(SUB)	C.I. TOTAL	EMISS. VS. PROC.								
1987-1	8804	88461	272,240	1253	278	3	370,758	.021	44	990	1031	.28%	1	26,732	13.87		.034	24,000	52,300	
1987-2	4604	96,763	32,348	3821	80	16	137,541	.032	45	1410	1455	1.06%	6	32,122	4.28		.062	27,000	83,300	
1987-3	3238	107,913	56,136	2794	81	19	170,086	.036	36	1496	1533	.90%	4	18,885	9.01	274 CL	.050	0	9800	
1987-4	-	144,306	31,154	1630	22	15	179,070	.028	26	770	796	.44%	4	36,835	4.86		.038	46,600	48,767	
1988-1	-	77,827	156,427	2267	95	16	236,551	.035	46	991	1037	.44%	4	40,357	5.86	46 CL	.046	25,000	72,000	
1988-2	-	143,679	10,516	4144	35	12	158,339	.019	34	967	1001	.63%	10	43,395	3.65		.016	20,300	85,200	
1988-3	-	31,032	61,935	923	73	9	92,890	.021	44	431	475	.51%	12	34,618	2.68	18 CL	.019	29,000	124,300	
1988-4	-	23,521	54,108	2636	63	32-C / 13-R	80,265	.056	50	1272	1321	1.65%	10	76,089	1.05	121 CL	.053	16,500	72,033	
1989-1	-	61,926	53,978	1018	529	238-C / 1-R	116,923	.068	113	4152	4270	3.65%	16	107,005	1.09	SPECIAL LIST	.095	21,100	88,600	
1989-2	-	49,809	21,500	876	5		72,185	.070	48	1039	1087	1.51%	7	91,392	0.79	NO UNUSUAL RELEASES	.019	35,100	230,200	
1989-3	-	33,112	25,101	3174	10		61,387	.0266	45	863	908	1.48%	13	71,570	0.81	NO UNUSUAL RELEASES	.013	46,700	54913	
1989-4	-	17,716	0	1161	0	0	18,877	.033	35	332	367	1.94%	9	19,456	0.91	NO UNUSUAL RELEASES	.003	52,200	333,900	
1990-1	-	72,693	817	2915	0	0	76,453	.015	34	1864	1898	2.48%	11	89,324	0.82	112 CL	.013	64,100	227,200	
1990-2	-	53,965	53,987	853	97	184	108,805	.032	68	3969	4036	3.71%	6	146,096	0.74	286 CL	.077	71,850	191,000	
1990-3	-	735	53,626	2187	0	0	56,548	.020	69	1004	1073	1.90%	9	79,729	0.71	508	.042	64,050	118,050	
1990-4	-	8645	40,800	3671	0	0	53,116	.058	38	938	977	1.84%	8	66,143	0.80	-	.069	48,500	110,500	

NOTES: C = CHINA MARKER LEAKER
R = REGULAR LEAKER LEAKER

USUAL RELEASE - (S)M2 =

* WELLS-(MONTHLY)-MURPHY, VANCE/WALTER
FOLK, MARTZ

BORES- 14, 16

Attachment 4

Combined Inspection Report Nos. 030-05980/91-001, 030-05982/91-001,
030-05981/91-001, 030-08385/91-001 and 030-08444/91-001

Department of Energy, Radiological and Environmental Laboratory

Evaluation of Bore Samples Collected in August 1990

August 1990 NRC Samples Analyzed by DOE
Radiological and Environmental Sciences Laboratory

Bore	Gross Beta Picocuries Per Liter	Gross Alpha Picocuries Per Liter	H-3 Picocuries Per Liter	Sr-90 Picocuries Per Liter
1	38,000 ± 1,400	1.8 ± 1.1	18,400 ± 500	18,800 ± 700
2	8,200 ± 300	1.1 ± 0.8	10,300 ± 400	4,900 ± 200
3	970 ± 40	1.1 ± 0.8	26,100 ± 700	540 ± 20
4	30 ± 5	10 ± 2	17,300 ± 500	---
5	11 ± 1	17 ± 4	5,500 ± 300	---
6	900 ± 50	0 ± 0.9	6,400 ± 300	490 ± 20
7	33 ± 6	0.3 ± 0.8	10,000 ± 400	14 ± 3
8	23 ± 5	-1.1 ± 0.8	7,600 ± 400	15 ± 3
9	81 ± 13	1.3 ± 0.8	11,300 ± 400	12 ± 2
10	62 ± 12	-0.6 ± 0.8	7,800 ± 400	24 ± 2
12	33 ± 11	1.8 ± 1.1	8,900 ± 400	23 ± 3
13	24 ± 10	-0.9 ± 1.0	20,900 ± 600	---
14	3 ± 9	0 ± 0.6	36,400 ± 800	---
15	-3 ± 8	0.3 ± 0.8	4,300 ± 300	---
16	-1 ± 9	1.9 ± 1.1	6,200 ± 300	---
18	29 ± 10	0.6 ± 0.9	19,800 ± 600	17 ± 3
19	230 ± 20	-0.3 ± 0.8	55,600 ± 1000	129 ± 7
21	670 ± 40	0.3 ± 1.0	70,400 ± 1,200	360 ± 16
22	820 ± 40	95 ± 14	44,900 ± 900	---
23	25 ± 10	7 ± 2	11,400 ± 400	---
24	18 ± 10	-0.3 ± 0.8	127,000 ± 20,000	10 ± 2
A	28 ± 5	-0.8 ± 0.9	11,800 ± 400	13 ± 3
B	6 ± 4	-0.3 ± 0.9	12,200 ± 400	0 ± 2
C	16 ± 5	4 ± 2	10,000 ± 400	1.4 ± 2.1
D	116 ± 10	0 ± 0.9	50,000 ± 1000	60 ± 4
E	45 ± 6	-1.1 ± 1.0	17,800 ± 500	28 ± 3
F	2 ± 4	4.6 ± 1.5	8,700 ± 400	---
G	9 ± 4	-1.1 ± 0.9	6,200 ± 300	5 ± 2
H	10 ± 4	0.3 ± 0.8	12,400 ± 400	1.7 ± 2.1
I	0 ± 4	0.8 ± 0.9	30,500 ± 700	---

BORES DATA

BORES #	DATE COMPLETE	DEPTH	DEPTH TO WATER	CONTRACTOR	REMARKS
I	10-10-78	24'	10' - 10"	GILES DRILLING	T.B.
II	10-11-78	24'	6' - 5"	GILES DRILLING	T.B.
III	10-12-78	24'	4' - 4"	GILES DRILLING	T.B.
IV	2-22-79	20'	4' - 6"	UNITEK CORP.	E.M.
V	2-20-79	20'	6' - 8"	UNITEK CORP.	E.M.
VI	2-21-79	20'	2' - 4"	UNITEK CORP.	E.M.
VII	2-14-79	20'	8' - 6"	UNITEK CORP.	E.M.
VIII	2-20-79	20'	7'	UNITEK CORP.	E.M.
IX	2-21-79	30'	19'	WIERAND Co.	E.M.
X	2-14-79	20'	7' - 6"	UNITEK CORP.	E.M.
XI	3-2-79	30'	14'	WIERAND Co.	E.M.
XII	3-1-79	30'	23'	WIERAND Co.	E.M.
XIII	2-20-79	30'	14'	WIERAND Co.	E.M.
XIV	2-15-79	30'	18'	WIERAND Co.	E.M.
XV	2-15-79	35'	26'	WIERAND Co.	E.M.
XVI	2-14-79	35'	26'	WIERAND Co.	E.M.
XVII	1945	60'	13'	WIERAND Co.	E.M.
XVIII	2-27-79	20'	6'	WIERAND Co.	E.M.
XIX	2-27-79	18'	5'	WIERAND Co.	E.M.
XX	8-22-79	6'	6'	WESTON Co.	K.S.
XXI	8-22-79	15'	7' 6"	STACKHOUSE	K.S.
XXII	8-22-79	12'	9' 6"	STACKHOUSE	K.S.
XXIII	8-22-79	27'	11'	STACKHOUSE	K.S.

7/14/89

Per C. Berlin, this date, best recollection, all bores whether cased with metal or plastic were cased to the bottom of the bore. C.B. recalls no screens used on any casing. Bore 20 was a sloppy fit, i.e., obviously water could run down between casing and wall of bore.

RGF