

November 17, 1999

FOR: The Commissioners
FROM: William D. Travers, Executive Director for Operations /s/
SUBJECT: RENEWAL OF THE SAFETY LIGHT CORPORATION LICENSES AT BLOOMSBURG, PENNSYLVANIA

PURPOSE:

To request Commission approval of the Staff's proposal to renew the Safety Light Corporation licenses and grant an exemption to the requirements of 10 CFR 30.35

SUMMARY:

In 1995, the staff renewed Safety Light Corporation's (SLC) byproduct material licenses through a Settlement Agreement reached after a protracted legal struggle and negotiations. The licenses expire on December 31, 1999. The Settlement Agreement states that the licenses cannot be renewed unless the licensee has adequate financial assurance or the Commission grants a further exemption from the requirements of 10 CFR 30.35. In its license renewal application, Safety Light Corporation requested this exemption based on its inability to meet the requirements of 10 CFR 30.35. This paper presents two options regarding renewal of the licenses for the Commission's consideration and, for the reasons presented below, recommends renewal of the licenses for a five year period subject to certain conditions.⁽¹⁾

BACKGROUND:

The SLC site is listed on the Site Decommissioning Management Plan (SDMP) and is located in Northeastern Pennsylvania, approximately five miles east of Bloomsburg, PA. The ten acre site is located on a flood plain along the north bank of the Susquehanna River. The site is bounded on the north by the Old Berwick Road, on the south by the Susquehanna River, and on the east and west by residential properties. There are approximately 16 buildings on site, some constructed in the 1940s and others constructed in the 1960s. Some of the older buildings are abandoned and in a state of disrepair with broken windows and collapsed roofs. The site also contains open areas and two lagoons which were used for radioactive waste disposal. Soil, groundwater, buildings and equipment at the SLC site are contaminated with several radionuclides from past operations. Tritium contamination is also present at the site from current licensed activities, which consist primarily of the manufacture of self-luminous signs using tritium under License No. 37-00030-08. On site exposure rates average about 10-15 microRem/hr above background with areas of elevated readings ranging from approximately 400 microRem/hr to 35 milliRem/hr. With the exception of tritium, all radioactive contamination at the site resulted from activities which ceased in 1969, before the regulatory requirements for financial assurance for decommissioning were codified.

The Safety Light Corporation has requested renewal of License Nos. 37-00030-02 and 37-00030-08 with an exemption from the financial assurance requirements of 10 CFR 30.35. The licensee does not have adequate funds to decommission the site covered under the above licenses for unrestricted use. The licenses will expire on December 31, 1999. The licenses were renewed on January 31, 1995, for a five year period as a result of a Settlement Agreement which the NRC entered into with SLC and USR Industries, USR Lighting Products, USR Chemical Products, USR Metals, and U.S. Natural Resources, collectively referred to as "USR Companies", corporations that were formed as a result of the restructuring of the predecessor company, United States Radium Corporation. The net effect of these corporate and name changes, restructuring and ownership transfers, was to limit the liability of the "USR Companies" and protect their corporate assets while SLC maintained an active license. The agreement was arrived at after the licensee's original requests for renewal of the licenses were denied due to the failure to satisfy 10 CFR 30.35.

Prior to the renewal of the SLC licenses in 1995, License No. 37-00030-02 had been in timely renewal since February 1984 and License No. 37-00030-08 had been in timely renewal since December 1987. The renewal of both licenses was denied by the NRC on February 7, 1992. During this time period the NRC had attempted to resolve financial assurance and decommissioning matters with the licensee. Additionally, the NRC staff was also involved in a review of financial liability in order to determine which of the United States Radium Corporation subsidiary companies were responsible for remediation of the Bloomsburg, PA site since the United States Radium Corporation no longer existed as a corporate entity, but SLC and the "USR Companies" were still in business. An Atomic Safety and Licensing Board (ASLB) Order dated December 28, 1994, approved the Settlement Agreement. This Order was signed by the President of SLC, the Chairman of the "USR Companies", and the then Director of NMSS. Under the Settlement Agreement, the licensee was granted an exemption from the financial assurance requirements of 10 CFR 30.35.

The Settlement Agreement was entered into based on the limited information available to the staff at that time and after a protracted legal struggle with the licensee. The legal issues centered on financial liability of the former and current SLC holding companies. The issues were resolved when the ASLB determined that both SLC and the "USR Companies" were responsible parties regarding financial liability for the Bloomsburg site. At the time of the Settlement Agreement, the cost of decommissioning was unknown since a comprehensive site characterization had not been performed. The theory of the settlement was, in part, to assure some funds were set aside while SLC completed site characterization and developed a specific decommissioning plan upon which reliable cost estimates could be based. Accordingly, the agreement called for SLC and USR Industries to make regular payments into an escrow account over the term of the renewal and to complete site characterization. The results of the characterization and a site decommissioning and decontamination plan indicated a significant shortfall between the available funds and the costs of site cleanup.

The Settlement Agreement also states that when the licenses expire on December 31, 1999, they may not be renewed unless the licensee demonstrates

that they can meet the financial assurance requirements of 10 CFR 30.35 or the NRC grants an exemption from the requirements. Therefore, this issue must be resolved prior to December 31, 1999, or the licenses will automatically expire. SLC has complied with the conditions of the Settlement Agreement, including monthly payments into a trust account for site maintenance and remediation, active resolution of outstanding insurance claims, and performance of the site characterization. In addition, SLC has prepared and submitted to the staff a Decommissioning and Decontamination (D&D) plan for the Bloomsburg site as well as a Health and Safety plan specific to remediation of the underground silos at the site. On September 29, 1999 the NRC issued an amendment to License No. 37-00030-02 which permitted remediation activities of the underground silos according to the licensee's D&D Plan and Health and Safety Plan. SLC began remediation work on the underground silos in October 1999 with completion expected in January 2000.

Additional background on the site and its radiological condition, the Settlement Agreement, and a brief site history are contained in [Attachments 1, 2, and 3](#).

DISCUSSION:

- [Option 1 - Denial of the License Renewals](#)
 - [Pros](#)
 - [Cons](#)
- [Option 2 - Renew the License](#)
 - [Pros](#)
 - [Cons](#)

There are two options with regard to Safety Light's renewal applications: denial of the renewals, or granting of the renewals along with an exemption from the requirements of 10 CFR 30.35. Before discussing these options, it is important to note that as a practical matter it will become increasingly difficult over time to find and hold responsible the USR companies. The connection between these successor companies and SLC will become weaker with time, as the corporate entities change names, ownership, and management, lessening the probability that the agency would be successful in holding these companies accountable. These matters are relevant since, at the current rate of escrow payment, it will take a very long time (about 25 years) to accumulate the funds necessary for site cleanup. Over this extended period, there is a strong possibility that SLC will cease operating and the site will become a federal liability. The options and their respective pros and cons are discussed below.

Option 1 - Denial of the License Renewals

Under this option, the staff would deny the license renewals since the licensee does not have the requisite financial assurance. The estimated cost to decommission the land, buildings and facilities contaminated from previous operations and licensed under License No. 37-00030-02 is approximately \$14 million. The NRC has not performed an independent cost estimate based on the License Termination Rule criteria and, therefore, there is some uncertainty that the actual costs may be lower or higher than the estimate. The licensee presently has available approximately \$1.9 million for decommissioning. The significant difference between the funds available for decommissioning and the estimated cost of decommissioning means that, should the licensee go out of business, there are insufficient funds to cover the costs of site cleanup. Additionally, the licensee has yet to provide a cost estimate for decommissioning the buildings and facilities which are contaminated from the ongoing tritium operations; which are licensed under License No. 37-00030-08.

PROS

- The licensee would be in compliance with NRC regulations in that it would not be operating without adequate financial assurance, (as presently allowed by the Settlement Agreement), and the license would eventually be terminated. A clear message would be sent to the industry that NRC would not permit continued operation in the absence of financial assurance sufficient to fund site cleanup. This option could deter other licensees from attempting to avoid their decommissioning liabilities through restructuring, ownership transfers and similar actions.
- Termination of the license would provide NRC staff the option of pursuing through litigation funds for remediation from the "USR Companies". This is not considered an option while there is an active license, as SLC, the licensee of record, is wholly legally responsible at this time, and until the license is terminated.
- Releases of tritium from the facility (already well within NRC limits) would decrease as would associated offsite dose consequences to the public. These decreases reflect the fact that operations would cease if the licenses were not renewed.
- Denying the license renewal could allow the agency to refer the site to the Environmental Protection Agency (EPA [EXIT](#) NEI), which could result in the site becoming a Superfund site. This would allow the government to attempt to obtain funds from other corporations previously a part of the predecessor licensee, and potentially from the former customers of SLC and predecessor companies that sent waste back to the site.

CONS

- If the site became an EPA Superfund site, it would probably receive a low priority from EPA since there would be little offsite dose consequences from the radioactive contamination. This would result in a longer time period until site remediation begins, and the costs to the government would probably be greater than any clean-up costs incurred by the licensee. Also, Superfund related litigation could delay site remediation.
- Maintenance of the site and site security could become an issue. Site security is currently maintained by the licensee. There is a fence around the site perimeter and access to the facility is controlled. If the license renewals are denied, the licensee's commitment to security and maintenance of the site might cease, particularly if the site is abandoned, although the Settlement Agreement commits the licensee to maintain the fence and warning signs for a period of 10 years after the renewal period. In addition, part of the site is leased to USR Metals, Inc., a manufacturing

company whose products do not involve the use of radioactive material. The question of non-Safety Light employees on the site would have to be resolved.

- Based on NRC experience during the previous renewal of the licenses, pursuit of the successor companies would be resource intensive for NRC and would have limited potential for success.
- There would be no additional payments to the Settlement Agreement trust fund by SLC.
- As an ancillary matter, there would be local economic impacts. Denial of the renewals would likely result in a total of approximately 30 individuals employed by Safety Light losing their jobs. This might impact the employment of the 35 USR Metals employees. Local jurisdictions would also be impacted as tax revenues from the site and the employees would cease.

Option 2 - Renew the License

Under this option, the licenses would be renewed for a period of five years with an exemption from the requirements of 10 CFR 30.35. During this period of time the licensee would be required, by approval of the Decommissioning Plan and incorporation into the license, using existing escrow funds, to perform significant remediation (removal and disposal of radioactive material from the underground silos, the most significant source term on site; and possibly other areas of contamination). After this remediation work is completed, the site would then be re-evaluated with regard to the criteria for both restricted and unrestricted use to determine if lower cost remediation options are practical. At the time of renewal, the NRC would reaffirm its position that it retains jurisdiction with regard to the USR Companies and their responsibilities regarding the decommissioning of this site.

Throughout the term of the renewed licenses, the licensee would be required to continue to set aside additional funds, from operating revenues, into a trust account to also be used for site decommissioning. Over the past five years, the licensee has contributed approximately \$350,000 to this trust fund. This amount, when combined with proceeds from insurance settlements and interest earnings, has grown to approximately \$1,900,000. As part of the renewal application, SLC proposed to repeat the contribution schedule identified in the Settlement Agreement: \$5,000/month for 24 months, \$6,000/month for 24 months, and \$7,000/month for 12 months.

Upon receipt of the application, the staff (with contractor assistance) began a review of five years of tax returns and revenues generated by SLC and Isolite (the marketing and distribution company for SLC's products). At the same time, the staff indicated to SLC that a greater contribution to the escrow account would be necessary to demonstrate SLC's commitment to funding the cost of site cleanup. SLC responded on August 3, 1999, with a proposal to increase the escrow account by approximately \$500,000 over the next five years, with increasing payments of \$7000/month (12 months), \$8,000/month (24 months) and \$9,000/month (24 months). With these additional payments and interest earnings of approximately 5.5% annually, the available funds at the end of five years would be approximately \$3,000,000 less any amounts approved for expenditure by the staff for remediation of the underground silos. The staff reviewed this proposal in light of its contractor evaluation of available resources and concluded that SLC could fund a more substantial commitment to the escrow, on the order of \$10,000/month for the five years of the renewal. The licensee considered this and concluded in a September 1, 1999, letter that its revenues could not support this higher level of funding. The staff concludes that further negotiations with the licensee in an attempt to increase contributions to the escrow account would not be cost effective due to the staff resources and time required, as well as the relatively small difference this would make in terms of overall funding. Accordingly, the staff would place a condition in the renewed license that requires SLC to contribute funds to the escrow account in accordance with the proposal outlined in their letter of August 3, 1999.

PROS

- The licensee would begin the site remediation by first removing the radioactive material from the underground silos and shipping the waste offsite for disposal at a total cost of approximately \$700,000.
- The licensee would continue to set aside additional funds from operating revenues into a trust account to be used for site decommissioning and controlled by the NRC (as is the case in the current Settlement Agreement) over the term of the license renewal.
- The offsite dose consequences to the public would remain unchanged. However, under this option the quality of groundwater should be improved as a result of the silo cleanup. Prior site surveys indicated that the main source of groundwater contamination appeared to be the underground silos.
- The licensee would be expected to perform site remediation tasks more cost effectively than the government. Therefore, a reduction of the site source term by the licensee would potentially lessen the government's clean-up costs if the licensee defaulted in the future or the license was not renewed at some future date.
- Renewal of the licenses would provide additional time for SLC to evaluate the site and develop alternative lower cost strategies for site cleanup.
- With licensee employees on site, the site would continue to be maintained, and site security would be assured.
- As an ancillary matter, there are positive economic effects beyond additional contributions to the escrow account. Individuals employed at the site would continue to be employed and generate tax revenues.

CONS

- The licensee would continue to operate the facility without adequate financial assurance in place. Although the licensee would continue to deposit funds into a trust account to be used for site remediation, achieving adequate financial assurance at some future date would not be assured.

- Renewal of the licenses could be interpreted by some licensees as an indication that NRC is not willing to take a strong regulatory position regarding the need for adequate financial assurance for site decommissioning and decontamination.

CONCLUSIONS:

After weighing the pros and cons of each option in this complex, difficult case, the staff has concluded that renewal of the SLC licenses is the most appropriate course of action. The bases for this conclusion are outlined in the following paragraphs.

The renewal or denial of the licenses would not significantly change the offsite dose consequences of the site. The only offsite doses are due to the operation of the tritium facility, and these releases are well within NRC limits. The only other potential offsite exposure pathway might be the offsite airborne release of radioactive material due to a fire in one of the older site buildings. However, based on the contamination levels present in the buildings, the offsite doses from this pathway would not significantly alter the offsite dose consequences of the site. There are no significant onsite radiation exposure hazards and potential for harm. Renewal of the licenses would allow the licensee to continue site remediation begun with the staff's approval of the amendment request to remediate the underground silos. Following silo remediation, additional analysis and site characterization may be performed as necessary to refine the decommissioning cost estimate, prioritize future work, and evaluate dose consequences as compared to 10 CFR 20, Subpart E License Termination Criteria.

There are a number of positive economic benefits if the licenses were renewed. SLC would continue to operate as a company and contribute funds to a trust account to be used for decommissioning. Individuals at the site would continue to be employed and generate tax revenues. In addition, there would be some reduction in the government's potential liability toward the site because SLC would have performed some site remediation that the government might have to perform at a later date, should the licensee ever default.

It should also be noted that in 1995, the agency renewed the Safety Light Corporation licenses without adequate financial assurance in place. The renewal took place after a protracted legal struggle and negotiations over the time period 1992 through 1995. In the five years since the licenses were renewed, protection of public health and safety has improved as the licensee has improved its financial position, the licensee has performed a detailed site characterization and generated plans for remediation, and the licensee has provided maintenance and security of the site. While it could take a long time for SLC to accumulate the funds needed to decommission the site, under a renewed license SLC may be able to partially remediate the site and also identify lower cost options for site remediation. However, this site would ultimately become a federal liability under either option should the funds needed to remediate the site not be obtained from either SLC or the USR Companies. An evaluation of the financial aspects of the two options shows that renewing the license will reduce the overall cost to the government by the amount of the additional SLC contributions to the escrow account (approximately \$500,000).

In special circumstances, the Commission has taken action to renew a materials license in the absence of adequate financial assurance. See *SECY 96-210, License Renewal Issues Regarding Shieldalloy Metallurgical Corporation's Facility in Newfield, NJ, SMB-743, (October 1, 1996)*. The licensee indicated it could not provide an acceptable decommissioning funding plan (DFP) for remediation of the site to unrestricted release levels by disposal of all stored material (slag piles containing uranium and thorium, for processed ore), and remain financially viable. In this case, the staff granted the renewal based on the economic worth of the stored material and the licensee pursuing a buyer outside the United States for that material. On the other hand, the staff proposed denial of the license renewal for Advanced Medical Systems, Inc. (AMS) based on inadequate financial assurance. The proposed denial was contested by the licensee, but the proceeding was terminated when the State of Ohio became an Agreement State on August 31, 1999. See *In the Matter of AMS, Inc., LBP-99-28 (August 4, 1999), affirmed CLI-99-26 (October 20, 1999)*. There are, however, significant differences between the SLC case and AMS which warrant a different approach for SLC. First, there are differences in the radiological risk profiles between the two sites. SLC has a low risk profile since there are no significant occupational hazards presented by the materials onsite and no offsite dose consequences from the radioactive contamination from previous operations. Conversely, conditions at the AMS site presented a potential for significant occupational radiation exposure, and may also have led to offsite contamination at the Northeast Ohio Regional Sewer District (NEORS) Southerly Plant. In contrast to AMS, SLC is an operating entity which continues to manufacture a product for a defined market, generate revenues, and set aside funds to be used for decommissioning. SLC has also submitted a decommissioning and decontamination (D&D) plan that presents tasks and reasonable cost estimates for D&D of the site. AMS submitted a D&D plan that relied, in part, on SAFSTOR as a means for decommissioning the site and whose cost estimates were determined by the staff to be unrealistic.

COORDINATION:

The Office of the General Counsel has reviewed this paper and has no legal objection. In addition, because the SLC licenses would be transferred to the Commonwealth of Pennsylvania when it becomes an Agreement State (presently scheduled for FY01), the staff has informed the Commonwealth, as well as EPA Region III, of the options being considered in this case. Representatives of both the Commonwealth and EPA Region III have attended NRC meetings with SLC, and Commonwealth management and staff have toured the SLC site with the NRC. Additionally, both the Commonwealth and EPA Region III have received copies of all pertinent decommissioning documents such as the Site Characterization Plan and the D&D Plan. The NRC has received no objections from either the Commonwealth or EPA Region III regarding the options being considered in this paper.

RECOMMENDATIONS:

The staff recommends that the Commission grant an exemption to the requirements of 10 CFR 30.35 and approve the renewal of the Safety Light Corporation's licenses for a period of five years. A license term less than the normal 10 years for materials was selected to allow the Commission the opportunity to reevaluate the licensee's circumstances at the end of five years and determine if a continued exemption from 10 CFR 30.35 is warranted.

As part of the renewal, the staff will place a specific condition in License No. 37-00030-02 which will require the licensee to contribute funds to a

decommissioning trust account over the life of the license. NRC approval will continue to be required for withdrawal of any funds from the account. A specific condition will also be placed in License No. 37-00030-08, the license for the tritium operations at the site, to require the licensee to prepare a D&D plan for the tritium facility.

original /s/ by
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Attachments: 1. [Descriptive Information on Site](#)
2. [Settlement Agreement](#)
3. [Site History](#)

ATTACHMENT 1

- [Description of the Site](#)
- [Site History](#)
- [Present Radiological Conditions](#)
- [Financial Assurance Requirement Background](#)

Description of the Site

The Safety Light site is located in Northeastern Pennsylvania, approximately five miles east of Bloomsburg, Pennsylvania. Situated in a valley that is 1-2 miles wide and bordered by two high ridges, the site is bounded on the north by the Old Berwick Road and on the south by the Susquehanna River. Residential properties are adjacent to the east and west boundaries of the ten acre site.

The Safety Light site contains contaminated soil, groundwater, and buildings as a result of work with a variety of radioactive materials which began as early as 1948. There are approximately 16 buildings on the site, some constructed as early as the 1940s and others constructed in the late 1960s. Some of the older buildings are abandoned and in a state of disrepair with broken windows and collapsed roofs. The site also contains open areas and two lagoons. The flow of groundwater on the site is toward the Susquehanna River.

Present licensed activities at the site consist primarily of the manufacture of self-luminous signs using tritium under License No. 37-00030-08. The licensee coats the glass tubes used in the self-luminous signs with a phosphor, ships the coated glass tubes to a facility in Canada where they are filled with tritium and sealed and then sent back to the Safety Light facility where the signs are assembled. The completed signs are marketed and distributed worldwide by Isolite Corporation, a privately held firm that has commonalities in management and ownership with SLC. In addition, the licensee manufactures foils containing tritium for use as targets in neutron-generating devices. A self-luminous sign contains approximately 10 curies of tritium, and a foil contains approximately 200 millicuries to eight curies of tritium.

No activities take place at the site under License No. 37-00030-02. This license was issued to Safety Light Corporation for the amount of radioactive material existing in contaminated facilities, land, and equipment from previous operations.

Site History

Work with radioactive materials at the site began in 1948 when United States Radium Corporation (USRC) relocated operations from Brooklyn, New York to Bloomsburg, Pennsylvania. The radionuclides in use at this time were Ra-226 and small amounts of Po-210. During this time period, 1948-1954, parts of an abandoned canal that ran through the site parallel to the river were used for radioactive waste disposal.

In the early 1950s, the licensee began to use other radionuclides along with Ra-226. These included Cs-137, Sr-90, H-3, Kr-85, and Ni-63. Manufactured products included civil defense check sources using Cs-137; deck markers for the U.S. Navy using Sr-90; clock and watch dials, and radiation therapy sources using Ra-226; and tritium light sources. During the time period, 1950-1960, solid radioactive waste was disposed of in two underground silos of approximately 650 ft each. Silo number one was used for Ra-226, Sr-90, and possibly Cs-137 disposal; while silo number two was used for Sr-90 and Cs-137 disposal, and possibly Ra-226. Liquid radioactive waste was still being disposed of in portions of the canal which ran through the site. In June of 1956, License No. 37-00030-02 was issued to USRC by the U.S. Atomic Energy Commission (AEC) covering the work at the site.

In 1969, work with all radionuclides except H-3 ceased at the site and License No. 37-00030-02 was amended to cover contamination of the site from previous operations in anticipation of site decommissioning and eventual unrestricted release. Also in 1969, the AEC issued License No. 37-00030-08 for work at the site involving H-3. A separate building was erected at the site to house the H-3 production operations. During 1971-1972, about 78 drums of soil, contaminated with Ra-226 were shipped offsite for disposal.

Groundwater monitoring wells were installed on the site in 1978 and 1979, and in 1981 Oak Ridge Associated Universities (ORAU) performed a radiological survey of the site. The ORAU survey identified soil contaminated with Ra-226, Cs-137, and Sr-90. Groundwater samples indicated levels of H-3 and Sr-90 above NRC guidelines.

In 1980, USR Industries, Inc., a newly formed corporation, was established as a parent-holding corporation and purchased, in exchange for its stock, the assets and business of USRC and the various business segments thereof, as such were comprised in 1980. The name of USRC was changed to Safety Light Corporation at about that time. USR Industries, Inc. then transferred all of its non-NRC-licensed operations to five other newly-created entities, all of which were wholly-owned subsidiaries of USR Industries, Inc. Thereafter, Safety Light Corporation, which retained all of the NRC-licensed operations, was sold to Lime Ridge Industries, Inc., a corporation formed by former employees of USR Industries and United States Radium but which is asserted by Safety Light as having no common ownership by or with USR Industries, Inc. The net effect of these corporate and name changes, restructuring and ownership transfers, was to limit the liability of predecessor companies and protect their corporate assets while SLC maintained an active license.

In 1990, another radiological and hydrogeological survey of the site was performed; this time by Chem Nuclear Systems, Inc. (CNSI). This radiological survey included soil coring, groundwater monitoring well installation, and rainwater sampling. Groundwater flow appeared to be toward the Susquehanna River, and there was no evidence to suggest lateral groundwater flow along the abandoned canal. Sr-90 was detected in both soil and groundwater samples. The radioactivity in groundwater appeared to be originating in the underground silos.

The licensee completed a site characterization study in 1995, and in 1998 submitted a site Decontamination and Decommissioning Plan (D&D Plan) to the NRC. The D&D Plan calls for remediating the site on a task by task basis involving three major tasks: removal of the radioactive material from the silos, remediation of the contaminated soil, and remediation of the contaminated buildings. The licensee plans to remove the radioactive material from the underground silos as the first task. The licensee has completed negotiations with a contractor for remediation of the silos. In August 1999, the licensee submitted to the NRC for review a work plan for the silo remediation, including a health and safety plan and a radiation protection plan.

Present Radiological Conditions

Soil, groundwater, buildings, and equipment at the Safety Light site are contaminated with Ra-226, Cs-137, Sr-90, and Am-241. Ra-226 and Cs-137 are the major contaminants. Tritium contamination is also present at the site from on-going operations at the site. Approximately three acres of soil are contaminated. The total amount of radioactivity in the soil is estimated to be about one Curie. Cs-137 concentrations in the soil vary widely, averaging about 120 pCi/g, but the median value is about 7 pCi/g. The Ra-226 average concentration in soil is about 480 pCi/g with a median value of about 230 pCi/g. Radioactive contamination in the site buildings also varies widely from approximately 200,000 dpm/100 cm² non-removable to no contamination in some locations. The majority of the areas of most buildings contain no contamination. The two largest buildings on-site occupy approximately 62,000 square feet of space and were divided into approximately 4000 two meter by two meter survey grids as part of the site characterization. Of these 4000 survey grids, only 63 contained loose, removable surface contamination greater than 1000 cpm/100 cm² and 105 contained fixed surface contamination greater than 5000 dpm/100 cm².

The groundwater contaminants are Sr-90 and Cs-137 as well as tritium. The Sr-90 in the wells having the highest concentrations ranges from approximately 15,000 to 100,000 pCi/l. The Cs-137 concentration in the wells having the highest concentrations is about 10,000 pCi/l. The tritium concentration in the wells having the highest concentrations range from 12,000 to 65,000 pCi/l. (For comparison, the NRC values for effluent releases in 10 CFR 20, Appendix B, Table 2, Water, are 500 pCi/l for Sr-90, 1000 pCi/l for Cs-137, and 1,000,000 pCi/l for tritium.) Well water samples taken from residences adjacent to the Safety Light site contain no radioactivity in excess of EPA drinking water criteria, based on gross alpha and gross beta analyses. Samples of river water and the nearest downstream municipal water supply indicated that all results are within EPA drinking water criteria based on gross alpha and gross beta analyses.

Dose rates over the outside areas of the site average about 10-15 Rem/hr above background. There are several areas of elevated dose rates with the highest being about 400 Rem/hr. Inside the buildings, the average dose rates for the most part are a few Rem/hr above background. However, there are a number of hot spots located in the buildings. The highest of these is the area directly over a drywell sump located in the former personnel building which reads 35 mRem/hr. The next highest hot spot is an area in the main building which reads about 1.4 mRem/hr.

Approximately 2000 cubic feet of waste containing 15,000 curies of tritium is presently stored on site. This waste was generated as a result of operations conducted under License No. 37-00030-08. The attic portion of an old house on site which contained some tritium contaminated duct work caught fire in October 1998. The bottom floor of the house was used for the storage of the tritium contaminated duct work. Only the attic portion of the house was damaged by the fire. There were no offsite dose consequences from this event.

There are no offsite dose consequences from the site due to the radioactivity remaining from previous operations. Effluent releases from the site from the on-going tritium operation, including both airborne and liquid pathways, are well within NRC release limits and EPA drinking water criteria.

Financial Assurance Requirement Background

As of July 27, 1990, licensees were required to comply with 10 CFR 30.35 of the Commission's regulations, which requires a licensee authorized to possess certain quantities of licensed materials having certain characteristics to submit a decommissioning funding plan (DFP) or certification of financial assurance for decommissioning in the amount prescribed in 10 CFR 30.35 in accordance with criteria set forth in that section. Safety Light has not submitted DFPs or certifications of financial assurance, as required by 10 CFR 30.35. Therefore, they are not in compliance with this requirement with respect to both their 37-00030-02 and 37-00030-08 licenses.

By letters submitted to the NRC dated January 11, April 8, August 1, and October 31, 1991, Safety Light described its attempts to secure financial assurance, asked the NRC to consider its coverage and claims under several insurance policies, and finally requested an exemption for 10 CFR 30.35.

The NRC staff notified Safety Light that the insurance policies did not satisfy the financial assurance requirements and denied Safety Light's request for an exemption from the regulation and issued a Demand for Information (DFI) to Safety Light requesting information when Safety Light Corporation would be in compliance with 10 CFR 30.35.

In January 1991, Safety Light documented its financial position and stated that because of its financial problems, it had not been able to obtain a commitment from a financial institution to satisfy the requirement. However, in response to the DFI, Safety Light indicated that the NRC staff should have confidence that it will be able to decontaminate the Bloomsburg site because it: (1) ".....is prepared to continue to litigate this matter ..." with its insurance carriers and file status reports with NRC every six months and (2) "..... is prepared to establish a separate trust account into which it will deposit any funds obtained through settlement or through a judgment [in its insurance litigation], to be used to decontaminate the site."

In January 1991, the NRC staff issued a DFI to USR Industries and its related corporations that was similar to the DFI issued to Safety Light. USR Industries argued that it was not an NRC licensee and that the NRC lacked jurisdiction over it and that it was not subject to the requirements in 10 CFR 30. However, NRC jurisdiction over USR Industries and its related corporations was affirmed by the Atomic Safety and Licensing Appeal Board.

As of February 7, 1992, the licensee had not demonstrated compliance with the requirements of 10 CFR 30.35. On February 7, 1992, pursuant to 10 CFR 2.103, the NRC staff denied the licensee's applications to renew their 37-00030-02 and 37-00030-08 licenses. Attached to the denial of the renewal of the licenses, the NRC staff issued an Order that required the licensee to satisfy the requirements in 10 CFR 30.35 and decontaminate and decommission the Bloomsburg site such that it can be released for unrestricted use.

At that time, Safety Light Corporation requested a hearing regarding the denial. The parties to the hearing reached a Settlement Agreement under which the license was renewed for a five-year period. The licenses were renewed on January 3, 1995 and, as noted above, will expire on December 31, 1999. The terms of the license renewal under the Settlement Agreement require the licensee to set aside funds into a trust account for decommissioning, pursue insurance claims to obtain additional decommissioning funding, and perform a site characterization, all of which have been accomplished. The Settlement Agreement also stipulated that, absent adequate financial assurance in accordance with 10 CFR 30.35, or the granting by the NRC of an exemption to these requirements, the licenses would expire on December 31, 1999, and not be renewed.

ATTACHMENT 3

History of the Safety Light Bloomsburg, Pennsylvania site.

Our knowledge of the history of the site is based on the information contained in the files of the NRC (and also the U.S. Atomic Energy Commission) and from personal discussions with a variety of individuals. The following is a chronology of the principle events which occurred at the Bloomsburg site.

- | | |
|----------------|--|
| 1948 | First use of radioactive material at Bloomsburg site. Relocation of U.S. Radium operation from Brooklyn to Bloomsburg and disposal of radium at Bloomsburg. During World War II this was a toy factory. |
| | Sometime between 1948 and 1951 U.S. Radium constructs one or two underground silos for disposal of radioactive waste. |
| 1951 | U.S. Radium begins use of strontium-90. |
| March 16, 1956 | L/N 37-00030-01 issued; authorized 1 curie of actinium-227. |
| June 20, 1956 | L/N 37-00030-02 issued; authorizing any byproduct material with atomic number 3 through 83 in any form limited only to no more than 25 curies per discrete source for research and development. |
| August 7, 1956 | L/N 37-00030-01 terminated. |
| Sept 10, 1958 | L/N 37-00030-02 renewed. |
| | A 1959 AEC inspection report describes how liquid radioactive wastes were released into the canal on site and subsequently drained through the ground into the Susquehanna River. It is likely that this disposal method resulted in contamination of the soil under and around the canal. |
| | In 1960 U.S. Radium began to take steps to characterize the radioactivity in the canal and to reduce the concentration of radioactivity in canal water by precipitating the radioactive material out of the solution. |
| May 17, 1961 | L/N 37-00030-02 renewed. |
| | In early 1961 U.S. Radium completed a new low level radioactive waste treatment facility. This facility resulted in cessation of liquid radioactive waste directly to the canal. |
| May 8, 1963 | L/N 37-00030-02 renewed. |

May 27, 1965 L/N 37-00030-02 renewed.

April 26, 1967 L/N 37-00030-02 renewed.

October 17, 1967 AEC memorandum documenting loss of approximately 3 curies of Americium-241 at U.S. Radium facility.

In 1969 U.S. Radium ceased using, for production purposes, all licensed materials except tritium. U.S. Radium submitted an application for a new license to authorize the production using tritium and asked that the existing license (L/N 37-00030-02) be renewed to allow only decontamination of the facility and disposal of radioactive materials.

April 24, 1969 U.S. Radium letter with application. Proposes a new license for activities other than tritium paint application and renewal of L/N 37-00030-02 until 9/30/69 (expired 5/31/69) to allow for decontamination and disposal.

August 5, 1969 L/N 37-00030-08 issued.

August 5, 1969 L/N 37-00030-02 is renewed for 1 year and authorized use is changed to "Decontamination, clean-up and disposal of equipment and facilities previously used for research, development, and processing under this license."

July 20, 1970 L/N 37-00030-02 renewed for 2 years.

In June 1972 there was a flood which covered the canal area, the silos and the liquid waste treatment building. This flood may have caused radioactive contamination to be spread to different areas of the site.

July 10, 1972 L/N 37-00030-02 renewed for 5 years.

In June 1977 U.S. Radium began the process to renew L/N 37-00030-02. The application did not provide details regarding the Corporation's plans for characterizing or remediating the Bloomsburg site. In the June 9, 1978 letter, the NRC makes it clear that it wants greater detail regarding U.S. Radium's plans and schedule for carrying out these activities. Only when U.S. Radium provided specific plans for characterizing and remediating the site, along with a schedule for accomplishing these activities, does the NRC renew the license. The renewed license contains both a requirement to perform specified activities and to provide NRC with a schedule for future activities.

June 7, 1977 License Renewal Application for L/N 37-00030-02.

April 5, 1978 U.S. Radium renewal application for L/N 37-00030-08.

January 25, 1979 L/N 37-00030-02 renewed requiring that specified decontamination and characterization activities take place and that "A report of status and schedule of work for the 12 months [sic] period commencing July 1 shall be submitted not later [sic] than July 1."

U.S. Radium began to take a number of steps which appear to be in response to the requirement to characterize and decontaminate the site. These include obtaining information from past employees concerning the radiological condition of the site and employing consultants to evaluate the radiological and hydrological condition of the site.

January 1979 According to documents filed by U.S. Radium with the SEC, Metreal, Inc. was formed as a subsidiary of U.S. Radium, at this time, with its only asset being the contaminated land at Bloomsburg.

In May of 1980, U.S. Radium begins a series of corporate restructuring, which resulted in the transformation of its Nuclear Division first into a wholly owned subsidiary corporation and then, following a sale, into an independent company with separate management (Safety Light Corporation). The NRC was unaware of the restructuring until 1983 when this matter was discussed during a routine inspection. No notification of the restructuring or the sale was made to the NRC by U.S. Radium or Safety Light Corporation, although the NRC was informed of an apparently simple name change in 1981.

May 16, 1980 Agreement between USR and U.S. Radium to merge. The NRC is unaware of this transaction.

August 1980 U.S. Radium reorganizes. The Nuclear Division which is responsible for the operation of the Bloomsburg site becomes Safety Light Corporation, a wholly-owned subsidiary of USR Industries. The NRC is unaware of this transaction.

Dec 19, 1980 Letter from Jack Miller requesting name change of U.S. Radium to Safety Light Corporation. Nothing is said about the corporate restructuring in August 1980, which resulted in the creation of a wholly-owned subsidiary which at this time controlled the licensed activities at the Bloomsburg site.

January 21, 1981 Letter from Safety Light Corporation stating name change to Safety Light Corporation and clarifying address.

March 31, 1982	L/N 37-00030-08 amended to incorporate contingency plans and name changed to Safety Light Corporation.
January 6, 1983	L/N 37-00030-08 renewed.
January 20, 1983	L/N 37-00030-02 amended to change name to Safety Light Corporation.
	In 1983, the NRC, during a routine inspection at the Bloomsburg site, determines that the licensed operation had been sold to several of its employees. The NRC believes, based on discussions with Jack Miller, Safety Light Corporation President during this inspection, that (1), the U.S. Radium Corporation split into two entities, Safety Light Corporation, the former Nuclear Division, and USR Metals, which constitutes the remainder of the U.S. Radium Corporation and that (2), the Safety Light Corporation was then sold to several of its employees. When the NRC received this information, it became concerned about the impact of this on the financial responsibility for the ultimate decontamination of the site and requested information on this matter and on the reorganization itself. The NRC also requested the licensee's current plans for scheduling the decontamination of the site. In Jack Miller's reply, he states that there were no organizational changes associated with the 1980 name change from U.S. Radium to Safety Light Corporation.
Nov 11, 1983	Licensee responds to requests for details regarding sale of Safety Light Corporation and refers back to the January 21, 1981 name change amendment submittal and further states that there were no organizational changes made due to the name change.
January 27, 1984	Licensee submits application for renewal of L/N 37-00030-02.
April 1, 1984	Licensing responsibility for L/N 37-00030-02 and 37-00030-08 transferred to Region I.
August 9, 1984	Materials Licensing Branch responds to Region I and provides suggested letter to USR informing them that they may be liable for site cleanup.
	In 1986, the NRC begins an inspection which initially focuses on the licensee's apparent inability to dispose of radioactive wastes generated by its tritium production. However, as part of this continuing inspection, the NRC observed that a sign at the site indicated that the Metreal Corporation apparently controlled the contaminated land at the site and that USR Metals personnel were working in buildings at the site which were contaminated with radioactive materials. The NRC requested information from the licensee regarding the ownership of land and the location of different firms personnel at the site.
	After receiving the information provided by Safety Light Corporation regarding the site contamination, ownership, and occupancy, the NRC again sought clarification of the relationships among the various corporations with apparent interests in the Bloomsburg facility and the role each would play in the cleanup of that site and requested additional information from the licensee.
Dec 31, 1987	Licensee submits application for renewal of L/N 37-00030-08
April 20, 1988	Letter providing the findings of Inspection 86-01 sent to all successors of U.S. Radium Corporation, including Safety Light Corporation and USR. This letter included a request for additional information about the sale and apparent violation of 10 CFR 30.34(b).
June 24, 1988	Licensee and USR respond to request for information.
February 7, 1992	Denial of renewal requests for L/N 37-00030-02 and L/N 37-00030-08.
December 28, 1994	Settlement Agreement approved by ASLB and L/N 37-00030-02 and L/N 37-00030-08 renewed (1/3/95).
September 5, 1998	Licensee's Site Characterization Plan submitted to NRC
November 5, 1998	Licensee's Decontamination and Decommissioning (D&D) Plan submitted to the NRC.
February 18, 1999	Licensee submits application for renewal of L/N 37-00030-02 (with a request for exemption from financial assurance requirements).
April 12, 1999	Licensee submits application for renewal of L/N 37-00030-08 (with a request for exemption from financial assurance requirements).
August 23, 1999	Licensee submits Work Plan, Health and Safety Plan, and Radiation Protection Plan for silo remediation work.

September 29,
1999

NRC issues amendment to License No. 37-00030-02 authorizing underground silo remediation in accordance with the D&D Plan and the Health & Safety Plan.

October 1999

Licensee begins underground silo remediation.

1. The staff submits this paper and recommendation in order to obtain the Commission's general views on, or objections to, the concepts and recommendations discussed in this paper. This is intended to be without prejudice to a Commission decision on the merits of these issues should there ultimately be a hearing on these matters.