

SAFETY LIGHT CORPORATION

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23 December 1986

U.S. Nuclear Regulatory Commission
Region I
King of Prussia, PA 19406

ATTN: Josephine M. Piccone, Ph.D.

RE: USNRC License No. 37-00030-08, Letter Dated 31 October 1986
from J. Miller to USNRC and Mail Control #106373.

Dear Dr. Piccone:

Pursuant to our phone conversation of 11 December 1986 in which you requested I answer several questions of concern regarding our possession limit increase of hydrogen-3 to 350,000 Curies, please be advised as follows:

The request of 350,000 Curies will enable Safety Light Corporation (SLC) to pursue a market area heretofore not feasible due to constraints in state of the art technology. Over the last four (4) years SLC has conducted an extensive research and development program on a product called the Light Wand. Although we have had a USNRC general license for this product for three (3) years, we had not successfully been able to penetrate the markets of airfield lighting because of luminous intensity limitations. Recently we have made tremendous gains in this area and on 19 December 1986, were awarded the contract referenced in my 31 October 1986 letter. We confirm that this increase in our possession limit will be used to safely manufacture the required product for the United States Air Force and other future customers and not solely to increase our waste possession.

We are and will continue to investigate economical and feasible methods of reducing the amount of waste currently in our possession and the resultant waste in manufacturing the Light Wand. Three potential methods being considered for waste reduction are a) Burial at licensed waste disposal sites; b) Recovery of tritium gas in rejected and returned products for use in new products; c) Redistribution of returned products in applications requiring less luminous intensity after careful quality inspection determines the product meets the original specifications at time of initial manufacture.

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We cannot at this time commit specifically to a maximum waste possession limit of 10% of our total possession limit because of the uncertainties that exist with the regulations and specifications required by the land burial method and the investigations and analysis needed to determine the feasibility of recovering tritium, however we will use 10% as a maximum guideline in developing time frames to better define one or more of the above mentioned resolutions to a problem that we are well aware of and remain concerned about.

During the four (4) years we have been developing the Light Wand, our goal has been to improve the luminous intensity and structural integrity of the product. Due to the large volume of tritium in each Light Wand additional tests of 50 psi internal pressure, liquid nitrogen thermal shock and helium leak detection simulating tritium are being conducted on 100% of the product before it is loaded with tritium. In addition to the product development we have addressed related issues such as process flow, handling methods, handling containers, storage, development of new equipment, modifications in areas to assemble the product and impact of emissions to our workers as well as to unrestricted areas.

A major investment in our developing the Light Wand was the designing and fabrication of a new tritium gas fill machine. Although the maximum quantity of tritium per source is much greater for the Light Wand than our other products, normal filling procedures and the associated risks of an inadvertent release while producing the Light Wand are not any more likely with the new gas fill system than our existing machinery.

The 1000 Curies release of 29 August 1986 occurred during generation of pressure to start filling glass sources with tritium. Similar pressures and volumes of tritium gas are calculated within the gas fill system for the Light Wand, consequently, an inadvertent release will not be proportionate to the quantity of gas within the finished product. We have incorporated into our machine design, two additional valves between the pyrophoric uranium traps and the vacuum pump, which provide greater redundancy and lessens the chance of another 1000 Curie release.

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Although the quantity of tritium from our supplier will be purchased in greater volumes for the Air Force order (50,000 Curies vs 20,000 Curies), we do not see a need for modifications to the Gas Handling/Storage System nor our procedures in this area given our satisfaction with previously proven designs and our experience with same.

In regards to a release from a broken source within the gas fill room, our records for the past two (2) years indicate that we have produced in excess of 140,000 exit sign type light sources and in excess of 300 Light Wand sources without a single breakage occurring. We plan to continue with the existing procedures and methods established in this area.

The following areas of precaution have taken place to assure ourselves that the new gas fill machine is acceptable in handling the requirements of the referenced order:

- a) Helium leak tested entire system to check for potential tritium leakage areas;
- b) Functionally ran system using an inert gas to qualify proper operation of gages, pumping systems, etc;
- c) Introduced tritium to all working aspects of system, excluding sealing of glass sources;
- d) Pre-tested entire system by tritium filling and sealing current exit sign sources;
- e) Initiated limited filling with tritium of exact sources required by the Air Force.

It should also be noted that the personnel responsible for designing and fabricating the gas fill system will be physically operating the entire system for a good portion if not all of the referenced order. Any training of other personnel in operating the new system will be conducted in accordance with our normal training procedures and their previous experience in operating gas fill machinery.

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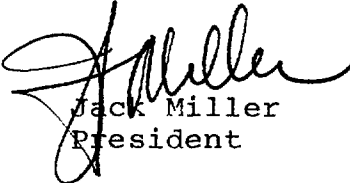
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Our production schedule on the new machine will be approximately 50-75 sources per 24 hours as compared to 600-1000 sources per 24 hours currently on other equipment. The recovery stubs remaining after sealing the Light Wand source contain approximately the same volume of gas as our exit sign sources. As previously indicated we do not expect many sources to actually break, thus the consistant daily emissions should be under 10% of what is normally attributed to gas fill machine production.

We feel that the total increase in emissions attributed to the manufacturing of the Light Wand product and its resultant affect on our workers and the surrounding environment is well within the permissible doses and level concentrations defined in 10 CFR Part 20.

Your most urgent reply and acceptance of this letter as support that SLC has recognized and taken the proper precautions to complete the Air Force order as well as continuing to satisfy other customers with the Light Wand product in a safe manner, would be greatly appreciated.

Very truly yours,
SAFETY LIGHT CORPORATION


Jack Miller
President