

*File: BEE  
(GL-122)*

Zip Code-17815

April 1, 1965

Mr. William O. Miller  
Isotopes Branch  
Division of Materials Licensing  
U. S. Atomic Energy Commission  
Washington, D. C. 20545

Dear Mr. Miller:

RE: AEC License GL122  
Your Ref: ML:IB:WOM(65365)

In Mr. C. C. Carroll's absence, I am replying to your letter dated March 25, 1965. The information you requested is provided below:

- (1) All exposed surfaces of the units will be thoroughly wiped with a moistened swab. After drying, the swab will be positioned, with all surfaces exposed, in an internal proportional (windowless) counting chamber and measured. As indicated in our previous letter, if the total removable activity on the swab exceeds 0.005 microcuries, the lot of 10 units involved will be re-checked for the purpose of identifying and rejecting any unit which shows a removable activity level in excess of 0.005 microcuries. Records of all swab test results will be maintained for examination by AEC inspection teams.
- (2) It is important, in our opinion, that the integrity of the tritium luminous paint proper be checked routinely. For this reason, we proposed that each lot of tritium luminous compound be subjected to a 24 hour water immersion test before use. As you will note from the drawings of the parts involved, the tritium paint is applied in recesses which are machined, engraved or etched into the substrate of the production parts. For the tritium paint leach tests, we propose to apply the paint, in a thin layer, to the flat surface of test strips of metal cut from sheets of the same metal as used in fabricating the production parts. Based on long-term experience gained with both radium and tritium paints, the adhesion of our paints to substrates such as various metals, glass, and plastics which are etched by the solvents in our adhesives, is excellent. An additional desirable feature is that, while in the production parts, the tritium paint is applied in recesses, it will be applied on the flat face of the test strips. Therefore, for a given weight of tritium paint, a considerably larger area of luminous paint

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surface will be exposed during the water immersion test than would be the case with the actual production parts, where an appreciable area of tritium paint surface would be in contact with the walls of the recesses and not with the test water.

- (3) In Item (2)(b) of Mr. Carroll's letter of January 11, 1965, it was stated that not less than three (3) samples would be used in the water immersion tests. This is patterned after the AEC-specified minimum quantity as contained in Condition 13.A of our License No. 37-30-6 covering tritium-painted timepieces.

The term "each manufactured lot of tritium luminous compound" does not necessarily define a production lot of Aircraft Safety devices. This results from the fact that, at times, portions of the same lot of tritium luminous compound might be used in the production of other types of markers prepared for shipment against specific licenses.

- (4) Over the course of the past year, we have shipped approximately 175 of this type of Aircraft Safety device against specific licenses. In no case was a situation found where the total removable activity level for any group swab tested over the 7 day test period exceeded the 0.005 microcurie level. In addition, over the course of the past 2-3 years, we have shipped against a specific license several hundred special instrument dials having essentially the same basic construction, tritium paint treatment and protective overcoating, i.e., <sup>NUMERICAL</sup> and graduations engraved in metal dial, cavities treated with tritium luminous compound, dial overcoated with protective lacquer. Again, all units shipped were found to meet the 7 day leak test. In our opinion, therefore, the proposed alternative procedure does provide control.

A final point which should be emphasized is that, in addition to testing of each batch of tritium paint used, each device will be swab-tested - this essentially represents a 100% swab test inspection which is a tighter requirement than that specified in the sampling table contained in Section 30.25 of 10 CFR 30.

Please do not hesitate to let me know if you require any additional information.

Yours very truly,

UNITED STATES RADIIUM CORPORATION

J.  
J. C. MacHutchin  
Manager of Research & Development -  
Bloomsburg Division

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CC: C. C. Carroll

E. M. Burtsavage

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