

NEC  
Leo: GL122

July 23, 1965

Mr. William O. Miller  
U. S. Atomic Energy Commission  
Washington, D. C. 20545

Dear Mr. Miller:

We wish to propose an alternative Quality Control test to be applied to devices containing hydrogen-3 gas filled light sources covered by our license GL-122. The reason for the proposal is that the twenty-four hour water soak degrades the finish on the samples to the point that they must be resprayed before they can be shipped. It is desirable to provide an equally dependable method which will avoid the cost and delay of the refinishing operation following the water soak test.

We propose the following alternative quality control procedure.

- (1) Sample production lots in accordance with Tables A or B, para. 30.25, as applicable.
- (2) One or more samples will be loaded into a chamber connected to a P-10 counting gas line which feeds through the chamber into an internal proportional counter capable of detecting down to  $2 \times 10^{-5}$  microcurie of activity. The chamber will be swept continuously with P-10 gas until a steady count rate is achieved. Any sample or group of samples producing a count rate that indicates leakage in excess of 0.1 per cent of the contained activity will be rejected and retested to locate the leaking unit(s), which will then be rejected.
- (3) Each production device will be wipe tested using one swab for a group of units. The maximum permissible removable activity will be based on that allowable for one unit, 0.005 microcurie. If any determination indicates the presence of more than 0.005 microcurie, the lot will be rejected and reinspected to identify the leaking unit(s). This test represents a 100 per cent swab test inspection.
- (4) At the present time each individual inner light source is leak tested using the P-10 counting gas method outlined under (2) before assembly into the inner housing. The test represents a 100 per cent inspection on all active components of the markers.

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Since the proposed method will determine tritium by direct measurement of the tritium gas, it is not affected by such variables as non-uniform distribution of tritium in the immersion water or the escape of the gas from the water during the vacuum pump-down. It is considered to be a more accurate and sensitive method for detecting tritium leaks than the water immersion method.

We would appreciate your consideration and approval of the method presented.

Very truly yours,

UNITED STATES RADIUM CORPORATION

C. C. Carroll  
Manager - New Products

CCC:va

cc: Dr. J. G. MacHutchin (2)