



UNITED STATES RADIUM CORPORATION  
4150 OLD BERWICK ROAD / BLOOMSBURG, PENNSYLVANIA 17815 / (717) 784-3510

December 14, 1977

Radioisotopes Licensing  
Division of Fuel Cycle and Material  
Safety  
U. S. NUCLEAR REGULATORY COMMISSION  
Washington, D. C. 20555

Attn: Mr. Frederick Combs  
Ref.: FCMS: RLB: FC  
(83842)  
NRC License 37-00030-10G

Dear Mr. Combs:

Enclosed are 1) a copy of my response to your letter of August 8, 1977, and 2) a revised quality assurance test procedure for the subject license. Basically, the revision is to add a reduced pressure test to the procedure.

If further information or clarification is needed, please let me know.

Very truly yours,

UNITED STATES RADIUM CORPORATION

J. D. McGraw  
Plant Manager

JDMcG  
jrn  
Enc.  
Cert. Mail - ret.rec.req.....

B/17

8505150313

MAX 5/2  
480

PROCEDURE  
FOR  
TRITIUM GAS-FILLED MARKERS

(Alternate to procedures  
in 10 CFR 32.55(b)(1))

**COMMENT:** This test is to be performed on 100% of all units containing Tritium gas.

**Purpose:** To determine if units containing Tritium gas are leaking; and, if so, to what extent. (NRC regulations limit leakage to 0.1% per unit over 24 hours.)

**Principle:** Measurement of Tritium concentration in air flowing through a test chamber containing samples after samples have been subject to reduced pressure.

**Equipment:**

- 1) Johnston Laboratories Tritium Monitor Model No. 855.
- 2) Test chamber designed so that air flow is exhausted 100% through detection instrument.
- 3) Suitable vacuum chamber and pump.

**Note:** Ionization chamber-equipped instruments other than Model No. 855 can be substituted providing they are shown to be sensitive enough.

**Standards:** Triton CL-1 calibrator.

**Note:** All Triton monitors are factory calibrated and normally need recalibration only after service.

**Procedure:**

- 1- Load samples into vacuum chamber.
- 2- Reduce pressure to 15 inches of mercury for two minutes.
- 3- Remove samples from vacuum chamber and examine for physical damage.
- 4- Load samples into test chamber.

Procedure (continued)

- 5- Set "Range" switch on Model 855 to zero and adjust zero to +10% of scale using "Meter Zero" knob.
- 6- Set "Range" switch to XI and record meter reading in log.
- 7- Connect Model 855 to test chamber. Allow 30 minutes for equilibration.
- 8- Record meter reading in log. Reading should not exceed that listed below (based on 25 LPM flowrate). Any reading greater than background should be communicated to department manager immediately. The manager will then see that the leaking device is isolated and the remaining devices retested.

600-1B1-S	and SF's	111	$\mu\text{Ci}/\text{m}^3$	$(\mu\text{Ci}/\text{ml} \times 10^{-6})$
600-1B1-S1	and SF's	86	"	"
604-04		167	"	"
604-07		278	"	"
604-11		278	"	"
616-03		139	"	"
616-05		258	"	"
737-2-6		236	"	"
737-2-8		292	"	"
758-D3, 3A		28	"	"
758-D4		28	"	"
758-14-1, -4		22	"	"
880-2-6		236	"	"

Note 1: Above values based on 25 LPM flowrate. If flowrate changes by more than 10%, values should be recalculated using formulas (1) and (2) below.

Note 2: Above values represent 0.1% per 24 hour leakage of Tritium content in a single device.

Procedure (continued):

Units other than those listed above can be leak checked in the same manner. Maximum meter reading can be calculated in the following way:

$$(1) \quad \text{Max. permissible leak rate } (\mu\text{Ci}/\text{min}) = \frac{\text{content in microcuries} \times 0.001}{1440 \text{ minutes}}$$

$$(2) \quad \text{Max. permissible meter indication } (\mu\text{Ci}/\text{ml or Ci}/\text{m}^3) = \frac{\text{max. permissible leak rate } (\mu\text{Ci}/\text{min})}{\text{flowrate thru equipment } (\text{ml}/\text{min})}$$

EX. A 3.5 Curie unit tested at 10 LPM -

$$(1) \quad \frac{3.5 \times 10^6 \times 1 \times 10^{-3}}{1.440 \times 10^3} = 2.43 \mu\text{Ci}/\text{min.}$$

$$(2) \quad \frac{2.43 \mu\text{Ci}/\text{min}}{1 \times 10^4 \text{ ml}/\text{min}} = 2.43 \times 10^{-4} \mu\text{Ci}/\text{ml}$$
$$= 243 \times 10^{-6} \mu\text{Ci}/\text{ml}$$

or

$$243 \mu\text{Ci}/\text{m}^3$$

On model No. 855, this is 24.3 on the X10 scale.

U.S. RADIUM

PARSIPPANY, N.J.

8/3/70 10 P

AUG 3 PM 5 35

U.S. ATOMIC ENERGY COMM.  
TWX 8317

TO MR. JACK M. BELL

U.S. ATOMIC ENERGY COMMISSION  
DIVISION OF MATERIALS LICENSING  
7920 NORFOLK AVENUE  
BETHESDA, MARYLAND 20010

FROM T. A. MATSUBARA

U.S. RADIUM CORPORATION  
1259 ROUTE 46  
PARSIPPANY, N.J. 07054

U.S. ATOMIC ENERGY COMM.  
MAIL ROOM  
MAIL ROOMS SECTION  
1070 AUG 4 AM 9 42  
RECEIVED

REF YOUR LETTER OF JULY 31, 1970

DEAR MR. BELL

IN RESPONSE TO THE ABOVE REFERENCED LETTER, I AM PLEASED TO MAKE THE FOLLOWING COMMENTS

1. ALL TESTS ON THE 616 AIRCRAFT MARKERS WERE COMPLETED ON JULY 22, 1970.

2. LOCKHEED ELECTRONIC COMPANY PERFORMED ONLY A VISUAL LIGHT OUTPUT CHECK FOLLOWING THE VIBRATION TEST, PART B, SINCE THERE WAS NO INDICATION OF ANY PHYSICAL DAMAGE TO THE AIRCRAFT MARKER. THE VIBRATION TEST WAS CONDUCTED FIRST. FOLLOWING TEMPERATURE-ALTITUDE TEST A, THE 616 DISPLAYS WERE TRANSPORTED TO OUR BLOOMSBURG PLANT. THIS WAS APPROXIMATELY 3 1/2 TO 4 HOURS FOLLOWING THE TEMPERATURE-ALTITUDE TEST. UPON RECEIPT OF THE ~~DISPLAYS AT OUR BLOOMSBURG PLANT, THE DISPLAYS WERE GIVEN BOTH A~~ VISUAL CHECK FOR LIGHT OUTPUT AND A WIPE TEST.

3. LOCKHEED ELECTRONIC COMPANY, IN THEIR REPORT OF JULY 20, MADE A TYPOGRAPHICAL ERROR, WHEREIN THEIR STATEMENT SAID, "EACH SIGN CONTAINS 2.0CC". THIS SHOULD HAVE READ, 2.0CI H-3. I ASSUME THIS IS TO WHAT YOU REFER SINCE WE HAD AN AGREEMENT MADE IN YOUR PRESENCE WITH MR. MALARO THAT WE WOULD USE 2.0 CURIES PER DISPLAY WITH A BALANCE OF THE NORMAL GAS PRESSURE BEING MADE UP WITH DEUTERIUM. THIS AGREEMENT WAS MADE IN MR. MALAROS OFFICE ON JUNE 24, 1970.

4. THE LOCKHEED ELECTRONICS COMPANYS LETTER OF REPORT, DATED JULY 20, DOES IN FACT STATE THAT THE EXACT PROCEDURE OF 10 CFR 32.101 B WAS FOLLOWED. I HAVE RECONFIRMED WITH THEM, BUT THEY FEEL THIS IS UNNECESSARY SINCE THEY DID REPORT FOR THE ENTIRETY OF PART B AND PART A.

5. PURSUANT TO YOUR REQUEST FOR RESPONSE TO YOUR JUNE 12 LETTER, PLEASE BE ADVISED THAT I AM HEREBY WITHDRAWING MY REQUEST REGARDING WITH-HOLDING OF INFORMATION FROM PUBLIC RECORD IF THIS PROBLEM IN ANY WAY DELAYS THE PROCESS OF THIS APPLICATION.

I HAVE BEEN REQUESTED BY OUR CUSTOMER, THE BOEING COMPANY, TO PROVIDE THEM WITH AN APPROXIMATE COMPLETION DATE. AN ADVISORY FROM YOU WOULD BE GREATLY APPRECIATED. PLEASE DO NOT HESITATE TO CALL ME, COLLECT, OR IN THE EVENT YOU CAN SEND THE INFORMATION BY TWX, MY NUMBER HERE IS 710 987-8325.

VERY TRULY YOURS,  
T. ALDEN MATSUBARA

8505150539 XA 5/XP 1P