



LIGHTING PRODUCTS DIVISION
UNITED STATES RADIUM CORPORATION
1259 ROUTE 46, PARSIPPANY, NEW JERSEY 07054 / (201) 335-9636

May 27, 1970

Mr. Jack M. Bell
U. S. Atomic Energy Commission
Division of Materials Licensing
7920 Norfolk Avenue
Bethesda, Maryland 20010

Subject: General License pursuant to 10 CRF 31.7
"Luminous Safety Devices for use in Aircraft"

Dear Mr. Bell:

Forward: United States Radium Corporation (USRC) herewith submits an application for a self-luminous safety display for use in aircraft for over-the-wing emergency exits. The purpose of the displays (USRC Part Number 616) is to provide various nomenclature that advises a passenger not only of the emergency egress but also simple instructions to open. USRC has tested various types of signs for visibility and readability at both direct viewing angles and very sharp, acute angles in the determination of the best type of display. The 616 embodies patented features of construction that have proven reliable for the containment of the radioactive byproduct material, Tritium. The construction of the 616 is illustrated in detail in attached drawings. USRC requests approval of the 616 Display based on similarity to the 758H1. Drawings are attached that demonstrate the similarity. Page 3 of this submission provides a verbal description of the 616 Display and its mounting.

S/NO

(8505160008 XA) BPP

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UNITED STATES RADIUM CORPORATION

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The following is pursuant to 10 CRF 31.7

- (a.) Because USRC is in possession of General License # 29-13537-02G for Aircraft Exit Displays, the Company is seeking an amendment which would allow the 616 to be added to this existing License.

The maximum containment of Tritium is 10 curies. Each device is manufactured and assembled in accordance with 10 CRF 32.53 (see next section.

- (b.) The 616 Safety Displays are distributed to only the aircraft industry for the specific use on aircraft or aircraft trainers.
- (c.) The 616 Displays are manufactured under the Specific License 37-00030-08:
- (d.) Any 616 Displays offered for export would be pursuant to the license which is presently pending with U. S. Atomic Energy Commission.
- (e.) The General License # 29-13537-02G (amendment to) is for the device specifically called out herein as a sealed source; the general Licensee is so advised.

In response to 10 CRF 32.53 "Luminous Safety Devices for use in aircraft; requirements for license to manufacture, assemble, repair or import."

United States Radium Corporation is in possession of a specific license to manufacture, assemble, repair or import luminous safety devices containing Tritium-----.

- (a.) USRC is in possession of a General License, thus demonstrating the ability to meet the requirements of 30.33.

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(b.) Attached to this application are the drawings, specifications and environmental tests pursuant to the 616 Displays.

- (1) Tritium (H-3) exists as a dry gas encapsulated in the LAB 785 glass tubes at a pressure of 500 to 700mm Hg.
- (2) Details of design and construction are called out in the drawings attached. Briefly, the Tritium is contained in glass tubes per LAB 785 at less than atmospheric pressure; the tubes are surrounded by a resilient potting gel which provides for both mechanical shock mounting as well as a secondary containmnet for the Tritium. The outer housing is composed of plastic (Rohm and Haas fire-retardant acrylic 5009) with the two materials cemented together forming a tirtiary containment.

The display is designed to mount in such a way that removal is impossible from the normal inside finished surface of the cabin of the aircraft. The 616 mounts through a hole that is slightly larger than the aluminum body but smaller than the front face. The display is secured with aircraft type fasteners from the rear of the mounting shroud.

- (3) Containment of the Tritium (in the form of dry gas) is in a sealed glass tube. The internal surface of the tube is phosphor coated serving as the transducer for emitting light derived from the Beta emission produced from the Tritium decay.
- (4) Prototype testing was conducted according to Paragraph 32.101 on the similar Model 758H1 to demonstrate that Tritium is not released to the environment under the most severe conditions likely to be incurred with normal use.

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(5) Quality Control Procedures are as follows:

The LAB 785 Tubes are the primary containment of the Tritium. The tubes are placed in container storage for a period of at least twelve (12) hours after which the air in the container is tested with a Triton Air Monitor, Model 755. This is a 100% test. After the tubes have been assembled into the 616 Display, two further tests are conducted on a 100% basis.

1. A Baird-Atomic Rate Meter 435 with a windowless gas flow proportional counter tests all displays.
2. Before shipping, a swab test (using filter papers) is conducted on each display. The swabs are tested in the above proportional chamber.

All manufacturing and storage facilities are continuously tested on a 24-hour basis by means of air monitors. Any leakage or breakage from a single LAB 785 Tube would be so indicated on the chart recorder of the air testing system.

Pursuant to Paragraph 32.55, USRC is allowed the above testing on a 100% basis rather than the sampling water emersion test specified under Paragraph 32.55 (b) (1) by US AEC.

- (6) USRC has over ten (10) years experience as a designer and manufacturer of self-luminous safety displays for the aircraft industry; devices were manufactured under a Specific License prior to the initial date of the General License dating 1962. An excellent safety record has been established pursuant to these items. Safety assurance is provided by the past experience, plus the prototype testing, plus the above quality control procedures listed in No. 5.

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- (c.) Each device will contain not more than ten (10) curies of Tritium.
- (d.) To assist the Commission in determining Parts (1), (2), (3) and (4), the following information is provided for reference:
- (1) Containment of Tritium is described under (b-3) above.
 - (2) The Tritium incorporated in the 616 Display is encapsulated pursuant to (b-2) above so as to prevent any direct physical contact by any person with it.
 - (3) Attached drawings referencing Paragraph (b-2) above demonstrate that the device is so designed that it cannot be easily disassembled.
 - (4) Prototype testing prescribed by Paragraph 32.101, Schedule B, is attached.

In reference to Paragraph 32.54 Labeling of Devices:

- (a.) The 616 Display will be labeled in accordance with Paragraph (a) and demonstrated further under USRC's existing licensing for aircraft exit displays General License # 29-13537-02G.

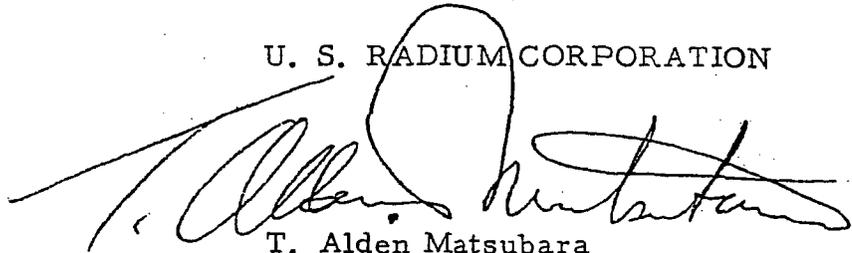
Mr. Jack M. Bell
U. S. Atomic Energy Commission

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Your prompt attention and consideration for the preceding application will be greatly appreciated. I will be in contact with you by telephone to make certain of the delivery to you, and for your estimated completion date.

Very truly yours,

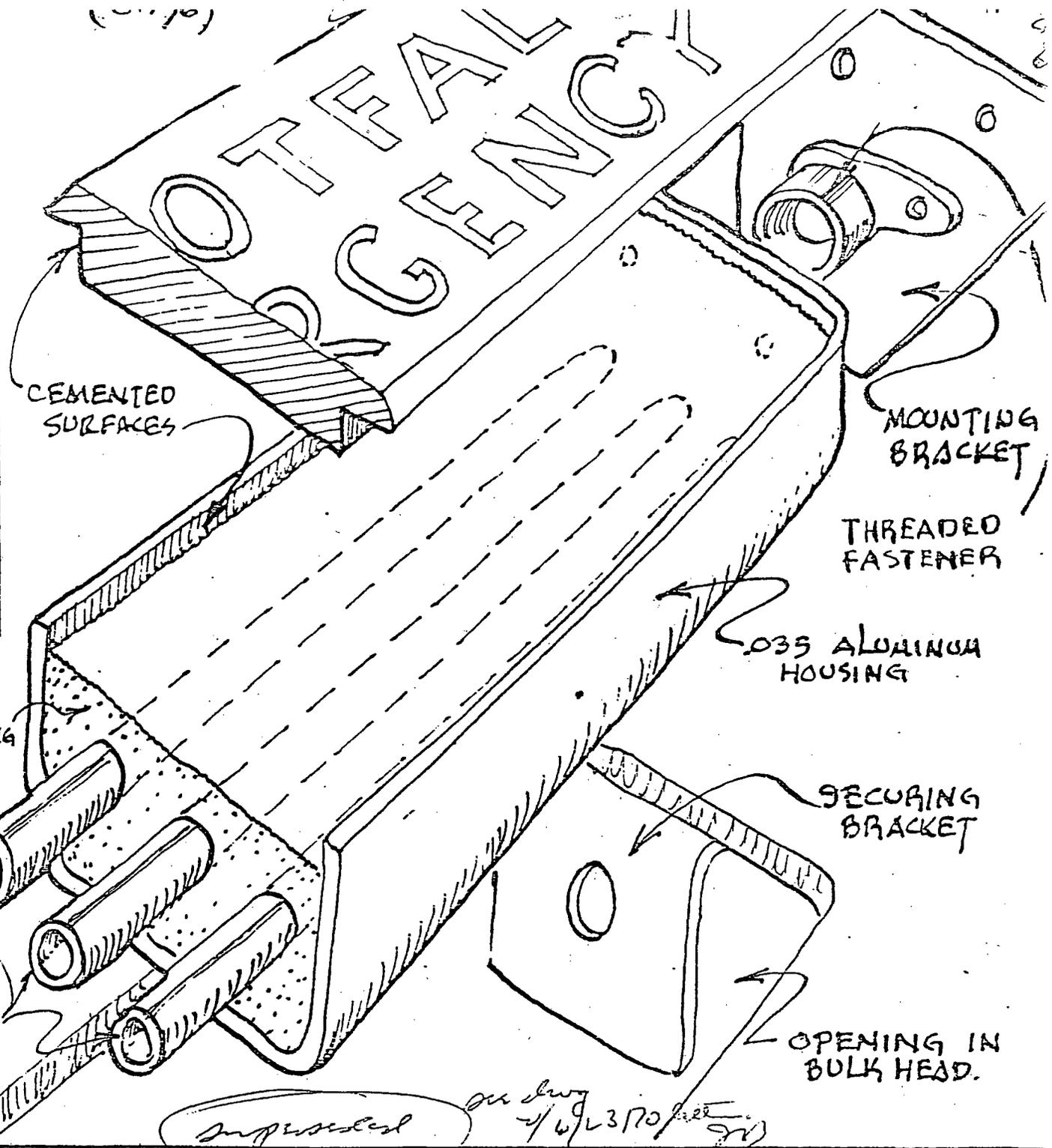
U. S. RADIUM CORPORATION

A handwritten signature in black ink, appearing to read 'T. Alden Matsubara', is written over the typed name. The signature is fluid and cursive, with a large loop at the end.

T. Alden Matsubara
Nuclear Products Specialist

TAM:cf

REVISIONS				
DATE				
APPR'D				
BY				
REV.				
DWG. NO.				



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NUCLEAR PRODUCTS DIV.		DEPT.	UNITED STATES RADIUM CORPORATION	
MATERIAL	TOLERANCES		D'W'N BY T.W.S.	TITLE
SPEC.	FRACTIONS $\pm 1/4"$	ANGLES \pm	C'K'D BY	616 EMERGENCY DISPLAY
THICKNESS	DECIMALS UNLESS OTHERWISE NOTED \pm		APPR'D BY	
	DECIMAL DIMENSIONS TO 5° \pm		DATE 26 MAY 70	
FINISH	DECIMAL DIMENSIONS 5° TO 15° \pm		SCALE NONE	
	DECIMAL DIMENSIONS 15° AND UP \pm		REF. DWG.	DWG. NO.
	THREADS CLASS — FIT		A 616-05.3-045	SUPERSEDES
DO NOT SCALE DWG.				

32208

REVISIONS

DATE

APR'D

BY

REV.

DWG. NO.

.225 ACRYLIC BLOCK

CLEAR RTV POTTING

.012 ALUM. CHANNEL

TRITIUM TUBE (LAB 785)

.062 ALUMINUM CHANNEL

.015 ALUM. PLATE.

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NUCLEAR PRODUCTS DIV.

DEPT.

UNITED STATES RADIUM CORPORATION

MATERIAL

TOLERANCES

SPEC.

FRACTIONS $\pm 1/64"$ ANGLES \pm

D'W'N BY T.W.S.^{JE}

TITLE

DECIMALS UNLESS OTHERWISE NOTED \pm

CK'D BY

THICKNESS

DECIMAL DIMENSIONS TO $5^\circ \pm$

APPR'D BY

DECIMAL DIMENSIONS 5° TO $14^\circ \pm$

DATE 26 MAY 70

FINISH

DECIMAL DIMENSIONS 18° AND UP \pm

SCALE NONE

THREADS CLASS — FTT

REF. DWG.

DWG. NO. 0062-2502-00-2

DO NOT SCALE DWG.

SUPERSEDES

758-H1
PULL HANDLE

08203