

RESPONSE TO FREEDOM OF
INFORMATION ACT (FOIA) REQUEST

2016-0778

3

RESPONSE
TYPE☐

INTERIM

☒

FINAL

REQUESTER:

Kellie Brunn

DATE:

APR 11 2017

DESCRIPTION OF REQUESTED RECORDS:

Copies of the approved material license applications for Trijicon (21-19874-02E), Cammenga (21-26460-02E), and TruGlo (42-23889-01E).

PART I. -- INFORMATION RELEASED

You have the right to seek assistance from the NRC's FOIA Public Liaison. Contact information for the NRC's FOIA Public Liaison is available at <https://www.nrc.gov/reading-rm/foia/contact-foia.html>

- ☒ Agency records subject to the request are already available on the Public NRC Website, in Public ADAMS or on microfiche in the NRC Public Document Room.
- ☒ Agency records subject to the request are enclosed.
- ☐ Records subject to the request that contain information originated by or of interest to another Federal agency have been referred to that agency (see comments section) for a disclosure determination and direct response to you.
- ☐ We are continuing to process your request.
- ☒ See Comments.

PART I.A -- FEES

NO FEES

AMOUNT*

*See Comments for details

- ☐ You will be billed by NRC for the amount listed.
- ☐ You will receive a refund for the amount listed.
- ☐ Fees waived.

- ☐ Minimum fee threshold not met.
- ☐ Due to our delayed response, you will not be charged fees.

PART I.B -- INFORMATION NOT LOCATED OR WITHHELD FROM DISCLOSURE

- ☐ We did not locate any agency records responsive to your request. *Note:* Agencies may treat three discrete categories of law enforcement and national security records as not subject to the FOIA ("exclusions"). 5 U.S.C. 552(c). This is a standard notification given to all requesters; it should not be taken to mean that any excluded records do, or do not, exist.
- ☒ We have withheld certain information pursuant to the FOIA exemptions described, and for the reasons stated, in Part II.
- ☒ Because this is an interim response to your request, you may not appeal at this time. We will notify you of your right to appeal any of the responses we have issued in response to your request when we issue our final determination.

You may appeal this final determination within 90 calendar days of the date of this response by sending a letter or e-mail to the FOIA Officer, at U.S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001, or FOIA.Resource@nrc.gov. Please be sure to include on your letter or email that it is a "FOIA Appeal." You have the right to seek dispute resolution services from the NRC's Public Liaison, or the Office of Government Information Services (OGIS). Contact information for OGIS is available at <https://ogis.archives.gov/about-ogis/contact-information.htm>

PART I.C COMMENTS (Use attached Comments continuation page if required)

This final response addresses the approved material license application records for TruGlo and Cammenga. (As a reminder, we included in interim response #1 a listing of the ML accession numbers for the TruGlo and Cammenga records that are available to the public in ADAMS.) An additional three TruGlo records, ML 033110162, ML033110290, and ML113350059, have now also been made available to the public in ADAMS. Records with an ML accession number are available in the NRC's Public Electronic Reading Room at www.nrc.gov/reading-rm/adams.html. For assistance in

[continued on next page]

Signature of Freedom of Information Act Officer or Designee

**RESPONSE TO FREEDOM OF INFORMATION
ACT (FOIA) REQUEST Continued**

2016-0778

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PART I.C COMMENTS (Continued)

obtaining any records, please contact the NRC's Public Document Room (PDR) at 1-800-397-4209 or by email at pdr.resource@nrc.gov.

With respect to the remaining five (5) Cammenga records, we have determined that they should be withheld in their entirety under exemption 4 (see Part II). They are:

ML15133A417 - 14 pages
ML14197A678 - 107 pages
ML14294A368 - 5 pages
ML15224B352 - 47 pages
ML15351A414 - 29 pages

With respect to the remaining TruGlo records, we have determined that portions of seven (7) records may be released at this time; they are enclosed. The remaining portions, as well as the entirety of three (3) more records, have been determined to be exempt from disclosure under exemption 4 (see Part II). The records withheld in their entirety under exemption 4 are:

ML113350052 - 3 pages
ML113350060 - 1 page
ML113350062 - 1 page

**RESPONSE TO FREEDOM OF
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PART II.A -- APPLICABLE EXEMPTIONS

Records subject to the request are being withheld in their entirety or in part under the FOIA exemption(s) as indicated below (5 U.S.C. 552(b)).

- ☐ Exemption 1: The withheld information is properly classified pursuant to an Executive Order protecting national security information.
- ☐ Exemption 2: The withheld information relates solely to the internal personnel rules and practices of NRC.
- ☐ Exemption 3: The withheld information is specifically exempted from public disclosure by the statute indicated.
- ☐ Sections 141-145 of the Atomic Energy Act, which prohibits the disclosure of Restricted Data or Formerly Restricted Data (42 U.S.C. 2161-2165).
- ☐ Section 147 of the Atomic Energy Act, which prohibits the disclosure of Unclassified Safeguards Information (42 U.S.C. 2167).
- ☐ 41 U.S.C. 4702(b), which prohibits the disclosure of contractor proposals, except when incorporated into the contract between the agency and the submitter of the proposal.
- ☒ Exemption 4: The withheld information is a trade secret or confidential commercial or financial information that is being withheld for the reason(s) indicated.
- ☐ The information is considered to be proprietary because it concerns a licensee's or applicant's physical protection or material control and accounting program for special nuclear material pursuant to 10 CFR 2.390(d)(1).
- ☒ The information is considered to be another type or confidential business (proprietary) information.
- ☐ The information was submitted by a foreign source and received in confidence pursuant to 10 CFR 2.390(d)(2).
- ☐ Exemption 5: The withheld information consists of interagency or intraagency records that are normally privileged in civil litigation.
- ☐ Deliberative process privilege.
- ☐ Attorney work product privilege.
- ☐ Attorney-client privilege.
- ☐ Exemption 6: The withheld information from a personnel, medical, or similar file, is exempted from public disclosure because its disclosure would result in a clearly unwarranted invasion of personal privacy.
- ☐ Exemption 7: The withheld information consists of records compiled for law enforcement purposes and is being withheld for the reason(s) indicated.
- ☐ (A) Disclosure could reasonably be expected to interfere with an open enforcement proceeding.
- ☐ (C) Disclosure could reasonably be expected to constitute an unwarranted invasion of personal privacy.
- ☐ (D) The information consists of names and other information the disclosure of which could reasonably be expected to reveal identities of confidential sources.
- ☐ (E) Disclosure would reveal techniques and procedures for law enforcement investigations or prosecutions, or guidelines that could reasonably be expected to risk circumvention of the law.
- ☐ (F) Disclosure could reasonably be expected to endanger the life or physical safety of an individual.
- ☐ Other

PART II.B -- DENYING OFFICIALS

In accordance with 10 CFR 9.25(g) and 9.25(h) of the U.S. Nuclear Regulatory Commission regulations, the official(s) listed below have made the determination to withhold certain information responsive to your request.

DENYING OFFICIAL	TITLE/OFFICE	RECORDS DENIED	APPELLATE OFFICIAL	
			EDO	SECY
Stephanie A. Blaney	FOIA Officer	proprietary information	<input checked="" type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>

Appeals must be made in writing within 30 calendar days of the date of this response by sending a letter or email to the FOIA Officer, at U.S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001, or FOIA.Resource@nrc.gov. Please be sure to include on your letter or email that it is a "FOIA Appeal."

TRUGLO, INC.

**U.S. NUCLEAR REGULATORY
COMMISSION REQUEST FOR
AMENDMENT**

PRESENTED TO:

MR. JOHN P. JANKOVICH

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NR-1180-D-101-E DATED 11-12-02**

**ATTACHMENT “H” – RADIOACTIVE MATERIAL LICENSE
FROM TEXAS DEPARTMENT OF HEALTH**

TRUGLO®

13745 Neutron Road

Dallas, Texas 75244

ph: (972) 774-0300

fx: (972) 774-0323

www.truglo.com

WHEN BRIGHTNESS COUNTS

1

May 20, 2003

Mr. John P. Jankovich
United States Nuclear Regulatory Commission
Materials Safety and Inspection Branch
Division of Industrial and Medical Nuclear Safety
Office of Nuclear Material Safety and Safeguards
Washington, D.C. 20555-0001

Dear Mr. Jankovich:

Please accept the enclosed documents as a request for an amendment to TRUGLO's existing U.S.N.R.C. License #42-23889-01E and Registration Certificate # NR-1180-D-101-E dated 11-12-02. Please note that the purpose of this request for an amendment is to add additional similar "aiming sights" to the already existing license. This request for an amendment is believed to have no affect on the original safety evaluation of the product. The intended purpose is to simply broaden the scope of product designs to allow TRUGLO to fulfill market demands and needs. Product has been designed and prototype testing has been conducted in accordance with NUREG -1556, Vol. 3 Section 10.5, as well as NUREG -1556, Vol. 8 Appendix "O". The results are included in the documents for your review.

We have followed the original format of the Sealed Source & Device Evaluation & Registration for Certificate # NR-1180-D-101-E in an attempt to present information for the additional "aiming sights" in a concise and efficient manner for your convenience.

In the event that information within a section of these documents remains exactly the same as previously submitted, accepted and approved by the U.S.N.R.C. for TRUGLO's existing License #42-23889-01E and Registration Certificate # NR-1180-D-101-E, then the following phrase appears under that particular section in blue ink: "Please refer to the same information as previously submitted, accepted and approved by U.S.N.R.C. for TRUGLO License #42-23889-01E and Registration Certificate # NR-1180-D-101-E dated 11-12-02."

In the event that only part of the information contained within a section of these documents has changed, the "new" or "updated" text appears in "blue" ink to distinguish it from the original text submitted by TRUGLO in accordance with the

issuance of License #42-23889-01E and Registration Certificate # NR-1180-D-101-E.

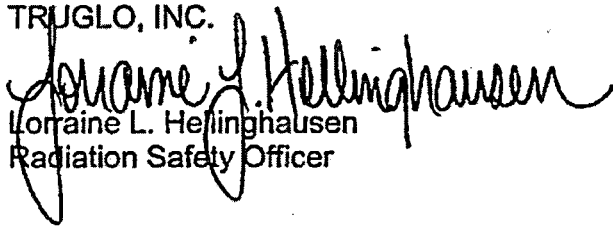
Any section containing only "new" information has all information appearing in "blue" ink as well to help distinguish that the information being provided is "new" and pertains to the requested amendment.

Please consider that similar "aiming sights" produced by other manufacturers have already received U.S.N.R.C. approval in reference to the following license numbers: MEPROLIGHT License #08-23873-01E; TRIJICON License #21-19874-01; TRILUX License #32-23774-02E; 21st CENTURY TECHNOLOGIES License #42-23850-02E.

No fee has been enclosed with these documents as it is our understanding that no fee applies to this request for an amendment to our current license. Please contact me with any questions or comments. I can be reached by telephone at 972-774-0300, or if you prefer to communicate via e-mail, I can be reached at lhellinghausen@truglo.com.

Thank you in advance for your time and consideration.

Sincerely,
TRUGLO, INC.


Lorraine L. Hellinghausen
Radiation Safety Officer

APPLICATION FOR AMMENDMENT TO
U.S.N.R.C. LICENSE #42-23889-01E
FOR THE APPROVED SEALED SOURCE & DEVICE EVALUATION &
REGISTRATION CERTIFICATE #NR-1180-D-101-E

NAME & ADDRESS OF APPLICANT:

TRUGLO, INC.
13745 NEUTRON ROAD
DALLAS, TEXAS 75244

INDIVIDUAL TO BE CONTACTED FOR ADDITIONAL INFORMATION:

LORRAINE HELLINGHAUSEN
RADIATION SAFETY OFFICER
972-774-0300

TRUGLO, INC. is applying to be both the manufacturer and distributor of the specified product(s).

PRODUCT NAME USED BY THE INDUSTRY:

The product proposed for the amendment is commonly known in the industry as an "aiming sight" or "gun sight". A "gun sight" is considered part of the same category as "aiming sights" which are products distributed to persons exempt from licensing under 10 CFR 30.19.

PRODUCT IS FOR USE BY:

The product proposed for the amendment is intended for use by the recreational sportsman or law enforcement personnel to improve low-light shooting capabilities. It will be sold to the general public.

PRINCIPAL USE CODE:

The principal use code for this product(s) is "W" – Self-Luminous Light Source .

LEAK-TEST FREQUENCY:

Please refer to the same information as previously submitted, accepted and approved by U.S.N.R.C. for TRUGLO License #42-23889-01E and Registration Certificate # NR-1180-D-101-E dated 11-12-02.

SEALED SOURCE INFORMATION:

Please refer to the same information as previously submitted, accepted and approved by U.S.N.R.C. for TRUGLO License #42-23889-01E and Registration Certificate # NR-1180-D-101-E dated 11-12-02.

Please note that the manufacturer LUMITEC has been omitted as part of this amendment based upon correspondence received by TRUGLO from Mr. Nima Ashkeboussi of the U.S.N.R.C. on September 20, 2002 stating that sources manufactured by LUMITEC are not registered with the NRC at this time.

**GASEOUS TRITIUM LIGHT SOURCE (GTLS)
HYDROGEN-3 (TRITIUM)**

All sealed sources suggested for use in this device(s) are approved by the N.R.C.

SEALED SOURCES FOR THIS DEVICE:

MB-MICROTEC – MODEL 400/1
UP TO 30 mCi PER SEALED SOURCE
NRC REGISTRY NO: NR-446-S-102-S.

SRB TECHNOLOGIES, Inc. – MODEL M-1
NRC REGISTRY NO. NC-585-S-102-S
UP TO 30 mCi PER SEALED SOURCE

MODEL INFORMATION:

The model numbers designated for these products are the TG131/231 Series. The series consists of front and rear sight combinations or front sights only.

TRUGLO TG-131 SERIES – TRITIUM/FIBER OPTIC GUN SIGHT SERIES

Front sight proposed to contain one 30mCi (maximum) GTLS unit.

Rear sight proposed to contain two 30mCi (maximum) GTLS units.

Maximum of 30mCi per sealed source and maximum of 90mCi per weapon.

MODEL INFORMATION CONT.:

TRUGLO TG231 SERIES – TRITIUM ONLY GUN SIGHT SERIES

Front sight proposed to contain one 30mCi (maximum) GTLS unit.

Rear sight proposed to contain two 30mCi (maximum) GTLS units.

Maximum of 30mCi per sealed source and maximum of 90mCi per weapon.

TRUGLO is requesting to have these model numbers listed as a "series" due to the similarity of the design and construction of the submitted products. The detailed engineering drawings submitted with this application will help illustrate this statement.

BYPRODUCT MATERIAL INFORMATION:

Please refer to the same information as previously submitted, accepted and approved by U.S.N.R.C. for TRUGLO License #42-23889-01E and Registration Certificate # NR-1180-D-101-E dated 11-12-02.

STRUCTURAL MOUNTING OF GTLS:

The information below outlines the method for the structural mounting of the GTLS. Please note that this procedure is the same procedure as previously submitted, accepted and approved by the U.S.N.R.C for TRUGLO License #42-2388901E and Registration Certificate # NR-1180-D-101-E dated 11-12-02 with the exception of the following fact:

Structural mounting bracket containing the affixed GTLS is NOT inserted into a steel casing.

The GTLS unit is placed into a structural mounting bracket of plastic or polymer tubing. The plastic or polymer tubing that surrounds the GTLS provides additional support and shock mounting in the design of the device. A gluing agent such as but not limited to silicone adhesive, epoxy and/or clear optical glue (acrylic adhesives) will be used to permanently affix the GTLS inside the plastic tubing. (See Attachment "A")

STRUCTURAL MOUNTING OF GTLS CONT.:

The protected GTLS is then inserted into a cavity in the metal "gun sight" housing. (See Attachment "B") Thus, the glass container encapsulates the tritium gas, and the structural mounting bracket provides mechanical support and shock protection for the GTLS in conjunction with the gluing agent. The all metal construction of the "gun sight" itself provides additional support and protection for the GTLS and prevents direct access to the GTLS at the same time.

DEGREE OF ACCESS TO HUMAN BEINGS:

As noted in the above section, the proposed device prevents direct access to the GTLS at any time during normal handling and use. The GTLS is permanently affixed within the metal "gun sight" housing.

TOTAL QUANTITY OF BYPRODUCT MATERIAL EXPECTED TO DISTRIBUTED ANNUALLY:

The anticipated sales of the proposed device are expected to be approximately 10,000 – 25,000 units in the first year. As the product is accepted into the marketplace, it is anticipated that sales will continue to grow to some extent. Based on a maximum of 90 mCi per front and rear sight combination X 25,000 units, there would be approximately a maximum of 2,250 Curies per year of tritium distributed across the United States in the first year. The "maximum" of 90 mCi is calculated by adding together the following:

1 Front Sight – Containing one 30mCi GTLS + 1 Rear Sight – Containing two 30mCi GTLS

Front and rear sights are commonly used in combination with each other to complete the sighting device. However, it is possible for the firearm to only require a front sight. This situation may be determined by the shooter or by the type of firearm or a combination of the two. In the case of a "front sight only" requirement, only 30mCi of tritium per device would need to be considered in the above equation. TRUGLO has chosen to illustrate the "maximum" set of circumstances at 90mCi per combination of front and rear sight to satisfy the U.S.N.R.C.'s evaluation.

ACTIVITY STORED IN ONE LOCATION:

Ideally, large quantities of product are not held in stock due to economic considerations and inventory constraints. Product in general is produced on an "as needed" basis to fill orders promptly without the burden of having excess inventory. Based on a combination of considering already registered devices and other types of tritium illuminated aiming devices that TRUGLO is proposing to be included as part of our current U.S.N.R.C. license and registration, although unlikely, it is estimated that the maximum activity to be stored at any one time contained in the exempt devices would not exceed 750Ci. For example purposes only, consider that this would allow for 5,000 front and rear gun sight combinations at a maximum of 90mCi per set for a total of 450 Ci, as well as 10,000 archery sight pins at a maximum of 30mCi each for a total of 300 Ci to accumulate in one location at a given time for a grand total of 750Ci.

Again, this "maximum" situation is also unlikely due to the fact that the combination of both the already registered and the proposed aiming devices are not all prominently demanded in the marketplace during the same time of year. For instance, the already approved archery sight pin is in high demand by the marketplace only in the months of July, August, September and October. Therefore production will vary depending on the product and the seasonality of the product.

CONDITIONS OF USE:

The sealed sources (Gaseous Tritium Light Sources) are proposed to be incorporated into a plastic or polymer sleeve that will then be incorporated into a metal housing known as the "gun sight". It is anticipated that future generations of proposed "gun sight" housings may even be constructed from high-tech plastics or resins as well.

CONDITIONS OF USE CONT.:

The proposed "gun sight" is used as a luminescent aiming device in low-light conditions for recreational hunting, target shooting purposes or possible law enforcement. These tritium illuminated aiming devices are designed as replacement parts for non-illuminated counterparts on projectile weapons such as but not limited to handguns, rifles, shotguns, muzzleloaders, air-rifles, soft-air guns, crossbows and archery equipment.

The proposed "gun sight" will then be incorporated onto an existing firearm. The submitted design of the GTLS contains similar tolerances that have already been approved by the NRC in tritium "gun sight" applications such as those submitted by 21st Century Technologies (No. 42-23850-02E) and Meprolight (No. NR-1119-D-101-E). Not to mention that the submitted design of the GTLS has already been approved by the U.S.N.R.C. for TRUGLO's own License #42-23889-01E and TRUGLO Registration Certificate #NR-1180-D-101-E.

The normal use of the proposed device is by the recreational hunter or target shooter (general public) or possible law enforcement personnel and the likely environment is the outdoors. Since the tritium illuminated aiming devices are attached for example to a firearm, they are only in close proximity to the shooter on a limited basis.

No accident conditions can be thought of with the exception of the firearm being dropped to the ground from the hands of a person standing on the ground. Damage to the actual GTLS is estimated to be a very remote chance since the actual firearm would take the impact of the fall to the ground. Firearms in general are designed to withstand compromising circumstances such as falls or drops to the ground. Submitted prototype testing confirmed that the GTLS was not compromised in any way when subjected to possible accident conditions.

(See Attachment "C")

EXTREME CONDITIONS:

Please refer to the same information as previously submitted, accepted and approved by U.S.N.R.C. for TRUGLO License #42-23889-01E and Registration Certificate # NR-1180-D-101-E dated 11-12-02.

The proposed device will not be subject to any extreme conditions as listed under Section 10.2 "Conditions of Use" of the NUREG-1556 Volume 3 since it will always be in the possession of the person handling the firearm. Firearms, even in the absence of the proposed tritium device must be handled with care to avoid unwanted adjustments to the equipment, especially the sight itself that will directly affect the accuracy and performance of the firearm. Not to mention that firearms in general should be handled in a safe manner to avoid endangering the general public.

ESTIMATED WORKING LIFE OF DEVICE:

Please refer to the same information as previously submitted, accepted and approved by U.S.N.R.C. for TRUGLO License #42-23889-01E and Registration Certificate # NR-1180-D-101-E dated 11-12-02 except as noted below in words appearing in blue ink.

Due to the radioactive nature of tritium and its radioactivity decay half-life of 12.3 years, the amount of tritium decreases with time. Tritium can also diffuse slowly through glass causing the brightness of the GTLS to dim over time. However, the estimated working life of the device is indefinite. Even if the tritium source expires and dims to the point that there is no visible illumination by the tritium, the fiber-optic material used in combination with the expired tritium source allows the archery pin to possess an indefinite life span. The fiber-optic material will continue to be used as the aiming point of the firearm even in the absence of the illuminating ability of the tritium. In the absence of the illuminating properties of the tritium component, the "gun sight" is still completely functional and is considered competitive with existing gun sight technologies. Thus, the proposed device has an indefinite working life-span.

MAXIMUM EXTERNAL RADIATION LEVELS AS REFERRED TO IN 10 CFR 32.22 (a)(2)(vi):

Please refer to the same information as previously submitted, accepted and approved by U.S.N.R.C. for TRUGLO License #42-23889-01E and Registration Certificate # NR-1180-D-101-E dated 11-12-02.

CONSTRUCTION OF THE PRODUCT:

The contained documents illustrate the construction of the proposed "gun sight(s)"

TG131- Series TRITIUM/FIBER OPTIC Version (See Attachment "D")

TG-231 Series – TRITIUM ONLY Version. (See Attachment "E")

TRUGLO at this time is also submitting variations to the TRUGLO TG-131/TG231 designs that constitute other proposed products to be contained in the TRUGLO TG-131/TG231 Series. As noted in the "MIN/MAX" charts contained on each drawing, the actual construction of the proposed "gun sight(s)" remains constant although shapes and overall sizes may change depending on model.

Changes in the mounting mechanisms vary to include a stake or dovetail shape. Tolerances of the dovetail dimensions considered as variations in shape or size of the dovetail are contained in these drawings to be considered as part of the series. Also changes in the dimensions considered as variations in shape or size of the stake are contained in these drawings to be considered as part of the series. Each variation is referenced for your convenience on the actual drawing.

Please note that small modifications to the cosmetic or aesthetic appearance ONLY of various metal sight housings may be implemented by TRUGLO, Inc. at a point in time to better suit market demand and/or customer needs and satisfaction.

MATERIALS USED IN CONSTRUCTION OF THE PRODUCT:

Materials used in the construction of the product(s) are stated on the submitted product drawings of the proposed sights. The materials are recapped as follows for your convenience:

1. GUN SIGHT BODY: Materials such as but not limited to: Steel or Aluminum
2. GUN SIGHT FIBER (Applicable to TG131- TRITIUM/FIBER OPTIC Series Only):
Fluorescent plastic fiber.
3. TRITIUM VIAL ASSEMBLY: GTLS and structural mounting bracket.
4. GLUING AGENTS : Such as but not limited to : silicone based adhesives, clear optical glue (acrylic adhesives), elastomer adhesive such as but not limited to trade name "Black Max" by Loc-Tite and/or epoxy.

LABELING:

Please refer to the same information as previously submitted, accepted and approved by U.S.N.R.C. for TRUGLO License #42-23889-01E and Registration Certificate # NR-1180-D-101-E dated 11-12-02 except as noted below in words appearing in blue ink.

It is not physically possible to mark or label the GTLS itself because of the size constraint of the sealed source. Thus, the metal "gun sight" itself (the device) will be machined, laser engraved, or stamped with the following: "TG-H3" to represent the symbol for the TRUGLO company logo and the symbol for the isotope tritium. The proposed and preferred method of labeling for the submitted sealed source and device is laser engraving. This method of labeling has previously been proven and accepted to be durable and withstand prototype testing as required for the device in accordance with the issuance of U.S.N.R.C. License #42-23889-01E and Registration Certificate # NR-1180-D-101-E for TRUGLO. Due to the extremely small size of the GTLS, as well as the device into which the sealed source is implemented, no additional information can physically be included.

LABELING CONT.:

In addition, packaging of the device itself will contain information demonstrating that the device contains tritium gas along with the proper instructions for returning defective product to the manufacturer for proper disposal.

PROTOTYPE TESTING of PROPOSED GTLS SOURCES:

Please refer to the same information as previously submitted, accepted and approved by U.S.N.R.C. for TRUGLO License #42-23889-01E and Registration Certificate # NR-1180-D-101-E dated 11-12-02.

PROTOTYPE TESTING OF PROPOSED DEVICE:

All prototype testing was conducted in accordance with NUREG-1556, Vol. 8, Appendix "O" as required. Prototype testing was performed to show the product's integrity in standing up to certain specified conditions such as thermal testing including temperature shock, high temperature, low temperature, and relative humidity, chemical testing, pressure testing vibration testing, and impact testing. Again, please note that there is no external radiation hazard from tritium. No structural degradation of the "gun sight" or structural mounting bracket containing the GTLS is anticipated. (See Attachment "C")

As previously identified, tritium decays with a characteristic half-life of 12.3 years. Tritium is known to slowly diffuse through glass and can oxidize to tritium oxide in the atmosphere.

Please note that it is believed that TRUGLO's "gun sight" models are very similar in construction to those already approved by the U.S.N.R.C. under issued licenses for the following companies:

MEPROLIGHT License # 08-23873-01E

TRIJICON License # 21-19874-01

TRILUX License # 32-23774-02E

21st CENTURY TECHNOLOGIES License # 42-23850-02E

ESTIMATED EXTERNAL RADIATION DOSES & RADIATION DOES RELEVANT

TO 10 CFR 32.23 & 32.24:

Please refer to the same information as previously submitted, accepted and approved by U.S.N.R.C. for TRUGLO License #42-23889-01E and Registration Certificate # NR-1180-D-101-E dated 11-12-02.

QUALITY ASSURANCE AND CONTROL:

Please refer to the same information as previously submitted, accepted and approved by U.S.N.R.C. for TRUGLO License #42-23889-01E and Registration Certificate # NR-1180-D-101-E dated 11-12-02.

22 pages withheld in their entirety –
exemption (b)(4)

Attachment "C"

The prototype testing for the TG-131/TG-231 Series pursuant to 10 CFR 32.22 is listed below. Five sets of sights from each series were subjected to the tests below. Each sight was visually inspected between each test, and after completion of all tests, to ensure that no detrimental effects had occurred. In summary, all sights passed. Visual inspections conducted in a darkroom, showed no reduction in light output or brightness.

Chemical. Each sight was immersed for 48 hours at room temperature in each of the following (i) gun oil, (ii) a cleaning compound that contained trichloroethylene and (iii) a cleaning compound according to MIL-C-372B.

Temperature. The following tests were performed on each sight:

High Temperature. The temperature of the sights were raised from ambient to 120°C and held at such temperature for one hour.

Low Temperature. The temperature of the sights were lowered from ambient to -46°C and held at such temperature for 48 hours.

Humidity. The sights were placed in an environment of 100% relative humidity and a temperature of 42°C and held in such environment for 48 hours.

Temperature Shock. The temperature of each sight was raised to 80°C and held at this temperature for 15 minutes. The sights were then transferred (within 15 seconds) to a cold chamber having a temperature of -46°C and held in this chamber for 15 minutes.

Vibration. Each sight was subjected to 10 cycles of simple harmonic motion having amplitude of 0.075 cm starting at 10 Hz, rising to 50 Hz, and decreasing back to 10 Hz in approximately one minute. In addition, each sight was subjected to a 30-minute cycle at 100 Hz. These tests were conducted in three planes.

Pressure. Each sight was placed in a test chamber and exposed to 0.25 and 2.0 bars for 4 periods of 15 minutes each. The pressure was returned to atmosphere between each period.

Penetration. A 13 gram weight with a small point was dropped from a height of at least one meter onto the exposed surface of the light source.

Mechanical Shock. This test was performed with the sights attached to the gun. The gun was then dropped from two meters onto a mat with a durometer of 95 over a concrete floor. The gun was dropped at least 60 times in such a manner that it struck the surface at least ten times in each of the following attitudes: (i) barrel vertical (upright), (ii) barrel vertical (inverted), (iii) barrel horizontal (front up), (iv) barrel horizontal (front down), (v) barrel horizontal (left side up) and (vi) barrel horizontal (right side up).

Firing. This test was performed using a mechanical "impact" device fabricated to impart on the sights a kinetic energy of 55 ft-lbs. Two sets of sights from each series were each continuously cycled 10,000 times on the fixture. For reference, a 45 caliber handgun weighing two pounds and firing a 230 grain bullet produces a recoil of approximately 10 ft-lbs. The recoil was calculated by using the "recoil calculator" at www.realguns.com.

10 pages withheld in their entirety –
exemption (b)(4)

ATTACHMENT "F"

NRC FORM 374

U.S. NUCLEAR REGULATORY COMMISSION

PAGE 1 OF 2 PAGES

MATERIALS LICENSE

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 36, 39, 40, and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations, and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

Licensee		
1. TRUGLO, Inc.		3. License number 42-23889-01E
2. 13745 Neutron Road Dallas, TX 75244		4. Expiration date November 30, 2012
		5. Docket No. 030-36055 Reference No.
6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license
A. Hydrogen - 3	A. Sealed self-luminous light sources (SRB Technologies Models M-1, and Mb-Microtec Model 400/1)	A. <input type="radio"/> Not applicable <input type="radio"/> (See Condition 11)
9. Authorized use: Pursuant to Section 32.22, 10 CFR Part 32, "Specific Domestic Licenses to Manufacture or Transfer Certain Items Containing Byproduct Material"; the licensee is authorized to distribute sealed self-luminous light sources in archery pins as specified in Condition 10 of this license to persons exempt from the requirements for a license pursuant to Section 30.19, 10 CFR Part 30, or equivalent provisions of the regulations of any Agreement State.		

CONDITIONS

10. The licensee is authorized to distribute the following series of self-luminous archery pin devices:

Device Model

Maximum Activity

TG-20 Series

30 millicuries (1110 MBq)

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**License Number
42-23889-01EDocket or Reference Number
030-36055**CONDITIONS**

(Continued)

11. This license does not authorize possession or use of licensed material.
12. Licensed material shall be distributed only from the licensee's facility located at 13745 Neutron Road, Dallas, Texas.
13. The licensee shall file periodic reports as specified in 10 CFR 32.25(c).
14. Except as specifically provided otherwise by this license, the licensee shall conduct its program in accordance with the statements, representations, and procedures contained in the documents, including any enclosures, listed below. The U.S. Nuclear Regulatory Commission's regulations shall govern unless the statements, representations, and procedures in the licensee's application and correspondence are more restrictive than the regulations.
 - A. Application dated June 12, 2002;
 - B. Letter dated August 29, 2002;
 - C. Letter dated September 26, 2002; and,
 - D. Registration Certificate No. NR-1180-D-101-E.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Date November 12, 2002

By

J. Bruce Carrico

J. Bruce Carrico
Materials Safety and Inspection Branch
Division of Industrial and
Medical Nuclear Safety
Office of Nuclear Material Safety
and Safeguards
Washington, DC 20555

ATTACHMENT "G"

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES SAFETY EVALUATION OF DEVICE

NO.: NR-1180-D-101-E

DATE: November 12, 2002

PAGE 1 OF 4

DEVICE TYPE: Bow Sight

MODELS: TG-20 Series

MANUFACTURER/DISTRIBUTOR:

TRUGLO, Inc.
13745 Neutron Road
Dallas, TX 75244

SEALED SOURCE MODEL DESIGNATION:

SRB Technologies, Model M-1

Mb-Microtec, Model 400/1

ISOTOPE:

Hydrogen-3

MAXIMUM ACTIVITY:

30 millicuries (1110 MBq) per bow
sight

LEAK TEST FREQUENCY: Not required

PRINCIPAL USE:

(W) Self-Luminous Light Source

CUSTOM DEVICE: _____ YES _____ ☒ NO

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO.: NR-1180-D-101-E DATE: November 12, 2002

PAGE 2 OF 4

DEVICE TYPE: Bow Sight

DESCRIPTION:

The TG-20 Series bow sights are primarily used by the recreational hunter or target shooter to improve low-light shooting capability. The sight pins are mounted onto archery sights that are affixed to the bow. All by-product material is tritium (H-3) in gaseous form, sealed into borosilicate glass tubes. The sources used are Mb Microtec Model 400/1 (NRC registration certificate NR-0446-S-102-S) or SRB Technology, Inc. Model M-1 (North Carolina registration certificate NC-0585-S-102-S). Each archery pin contains one source consisting of a maximum activity of 30 mCi (1110 MBq).

The gaseous tritium light source (GTLS) units are placed into a structural mounting bracket of plastic tubing which is inserted into a steel casing. A gluing agent is used to permanently affix the plastic tubing into the steel casing. The sources are inaccessible to the user. The sight is mounted to the bow by means of a screw/clamp connection. The overall dimensions for the bow sight are 1.2 inches (3cm) in length and 0.2 inches (0.5 cm) in width.

The TG-20 Series bow sights consist of three models. The difference between the three models is the shape of the base. The base may be square, rectangular, or round. The TG-20 Series estimated working life is indefinite.

LABELING:

Each sight is permanently marked with the TRUGLO logo "TG" and the symbol for tritium (H-3). The logo and H-3 are marked on the side of the sight pins. In addition, packaging of the device will contain information identifying the fact that the device contains tritium gas along with the proper instruction for the return of an unwanted device or defective product back to the manufacturer for disposal.

DIAGRAMS:

See attachment 1.

PROTOTYPE TESTING:

The following prototype tests for TG-20 Series were conducted:

- Temperature: The sight pin was subjected to temperatures varying from 248°F (120°C) held for one hour to -50°F (-46°C) held for 48 hours.
- Humidity: The sight pin was placed in an environment of 100% relative humidity and held at that humidity for 48 hours.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO.: NR-1180-D-101-E

DATE: November 12, 2002

PAGE 3 OF 4

DEVICE TYPE: Bow Sight

PROTOTYPE TESTING (Cont'd):

- Temperature Shock: The temperature of the sight pin was raised to 176°F (80°C) for 15 minutes and then transferred to a cold chamber having a temperature of -50°F (-46°C) and held in the chamber for 15 minutes.
- Pressure: The sight pin was placed in a test chamber and exposed to 0.25 bars (25 kPa) and 2.0 bars (200 kPa) for four periods of 15 minutes.
- Penetration: A 0.02 lb (10 gram) hammer with a small point was dropped from a height of 3.3 ft (one meter) onto the exposed surface of the light source.
- Mechanical Shock: The sight was attached to the bow and dropped 6.6 ft (two meters) onto a concrete floor. The bow was dropped in a manner that it struck the floor in the following positions: bow vertical (upright), bow vertical (inverted), bow horizontal (front up), bow horizontal (front down), bow horizontal (left side up), and bow horizontal (right side up).

The same sight pins were used for each test above. Each sight pin was visually inspected between each test and after completion of all the tests to ensure that no detrimental effects had occurred. The prototype testing exhibited no tritium leakage or breakage of the sight or source.

QUALITY ASSURANCE AND CONTROL:

TRUGLO, Inc. has submitted a quality assurance and control (QA/QC) program that has been found to be acceptable by NRC for the production and distribution of the TG-20 Series sights by TRUGLO. A copy of this program is on file with the NRC.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO.: NR-1180-D-101-E

DATE: November 12, 2002

PAGE 4 OF 4

DEVICE TYPE: Bow Sight

SAFETY ANALYSIS SUMMARY:

Based on our review of the information provided and the test data cited above, we conclude that TRUGLO, Inc.'s TG-20 Series bow sight models meet the safety criteria set forth in 10 CFR 32.23. Furthermore, we conclude that the TG-20 Series' sealed tritium light sources would be expected to maintain their containment integrity for normal conditions of use and accidental conditions which might occur during use. Therefore, we conclude that the TG-20 Series bow sights are acceptable for exempt licensing purposes.

REFERENCES:

The following supporting documents for TRUGLO, Inc. archery sight are hereby incorporated by reference and are made a part of this registry document.

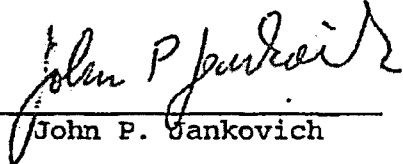
- TRUGLO, Inc. device registration and exempt materials license applications dated June 12, 2002, with enclosures thereto.
- TRUGLO, Inc. letters dated August 29, 2002 and September 26, 2002, providing additional information.

ISSUING AGENCY:

U.S. Nuclear Regulatory Commission

Date: November 12, 2002

Reviewer: _____


John P. Gankovich

Date: November 12, 2002

Concurrence: _____

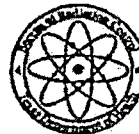

Ujagar S. Bhachu

Page 023 of 131

Withheld pursuant to exemption

(b)(4)

of the Freedom of Information and Privacy Act

**RADIOACTIVE MATERIAL LICENSE**

Pursuant to the Texas Radiation Control Act and Texas Health Department regulations on radiation, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess and transfer radioactive material listed below; and to use such radioactive material for the purpose(s) and at the place(s) designated below. This license is subject to all applicable rules, regulations and orders of the Texas Department of Health (Agency) now or hereafter in effect and to any conditions specified below.

LICENSEE

1. Name **TRUGLO INC**
ATTN LORRAINE L HELLINGHAUSEN
2. Address **13745 NEUTRON ROAD**
DALLAS TX 75244

This license is issued in response to a letter

Dated: **November 5, 2002**Signed by: **Lorraine L. Hellinghausen**

3. License Number

L05519

Amendment Number

01**ATTACHMENT "H"****PREVIOUS AMENDMENTS ARE VOID**

4. Expiration Date

March 31, 2010**RADIOACTIVE MATERIAL AUTHORIZED**

5. Radioisotope A. H-3	6. Form of Material A. Sealed source (SRB Technologies, Inc., SRB Model Type MH sealed light source)	7. Maximum Activity* A. No single source to exceed 30 mCi Total: 300 Ci	8. Authorized Use A. Manufacture and storage of archery pins containing self-luminous light sources pending distribution pursuant to U.S. Nuclear Regulatory Commission License No. 42-23889-01E.
B. H-3	B. Sealed source (Lumitec Models CL/1, 5/4, 85, CL/0, 95/3, 3; SRB Tech. Models PRH- 800/G/200)	B. No single source to exceed 30 mCi Total: 300 Ci	B. Manufacture and storage of archery pins containing self-luminous light sources pending distribution pursuant to U.S. Nuclear Regulatory Commission License No. 42-23889-01E.
C. H-3	C. Sealed source (MB-Microtec Models 400/1, 400/2 and 400/3)	C. No single source to exceed 30 mCi Total: 300 Ci	C. Manufacture and storage of archery pins containing self-luminous light sources pending distribution pursuant to U.S. Nuclear Regulatory Commission License No. 42-23889-01E.

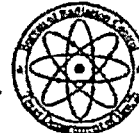
* Ci-Curies mCi-Millicuries μ Ci-Microcuries

9. Radioactive material shall only be stored and used at:

Site Number
000Location
Dallas - 13745 Neutron Road

10. Each site shall maintain documents and records pertinent to the operations at that site. Copies of all documents and records required by this license shall be maintained for Agency review at Site 000.

11. The licensee shall comply with the provisions (as amended) of Title 25 Texas Administrative Code (TAC) §289.201, §289.202, §289.203, §289.204, §289.205, §289.251 and §289.252.



RADIOACTIVE MATERIAL LICENSE

LICENSE NUMBER	AMENDMENT NUMBER
L05519	01

12. The individual designated to perform the functions of Radiation Safety Officer (RSO) for activities covered by this license is Lorraine Hellinghausen.
13. Radioactive material shall be used by, or under the direct supervision of, individuals designated by the RSO only after each worker has successfully completed a training course determined by the Agency as appropriate. Documentation verifying the successful completion of the training for each worker shall be maintained by the licensee for inspection by the Agency.
14. Sealed sources containing radioactive material shall not be opened.
15. The licensee shall conduct a physical inventory, at least every six months, to account for all sealed sources received and possessed under the license. The records of the inventories shall be maintained for inspection by the Agency for three years from the date of the inventory and shall include the radionuclide, number of curies, location of each source of radiation, the name of the individual making the inventory, and the date of the inventory.
16. The licensee shall conduct radiation contamination surveys of all radioactive material use and storage areas at intervals not to exceed 30 days or when it is suspected that a tritium light source has become compromised. Surveys shall be taken in the form of surface wipes using appropriate media for subsequent gas proportional counting or liquid scintillation counting. If analysis reveals the presence of radioactive contamination in excess of the limits contained in 25 TAC §289.202(ggg)(6), the licensee shall immediately enable contamination control actions and notify the agency of the analysis findings.
17. Except as specifically provided otherwise by this license, the licensee shall possess and use the radioactive material authorized by this license in accordance with statements, representations, and procedures contained in the following:

application dated January 21, 2002,
letters dated March 18, 2002 and March 21, 2003.

Title 25 TAC §289 (as amended) shall prevail over statements contained in the above documents unless such statements are more restrictive than the regulations.

DBF:ks

Date

April 18, 2003

FOR THE TEXAS DEPARTMENT OF HEALTH


David B. Fogle, Chief
Advanced Technology Licensing Program

TRUGLO

TRUGLO®

13745 Neutron Road

Dallas, Texas 75244

ph: (972) 774-0300

fx: (972) 774-0323

www.truglo.com

WHEN BRIGHTNESS COUNTS

October 14, 2003

Margaret Stambaugh
Nuclear Safety Intern
Materials Safety and Inspection Branch
Division of Industrial and Medical Nuclear Safety
Office of Nuclear Material Safety and Safeguards
United States Nuclear Regulatory Commission
Washington, DC 20555-0001

via email and FedEx


Re: Request for Amendment to U.S.N.R.C. License No. 42-23889-01E and Registration Certificate No. NR-1180-D-101-E

Dear Ms. Stambaugh:

This letter is in response to your written request for additional information, dated October 10, 2003. We have tried to address each item so that the review of our amendment can proceed. Our responses are stated on the following pages.

We appreciate all your help and prompt attention. If you have any questions, please do not hesitate to contact me at (972) 774-0300. Again, thank you.

Sincerely,


Lorraine Hellinghausen
Radiation Safety Officer
TRUGLO, Inc.

1. The models used in testing were TG131GT1 (front and rear) and TG231G1 (front and rear). These models are represented by the drawings for the TG131 Series – A1 (front) and B1 (rear) and TG231 Series – A1 (front) and B1 (rear), respectively.

Models:

TG131 Series – A1 (front)
TG131 Series – B1 (rear)
TG231 Series – A1 (front)
TG231 Series – B1 (rear)

Dim. A Dim. B Dim. C Dim. D Dim. E

(Confidential treatment is
requested under separate cover.)

We feel it is important to note that all models within each series maintain a consistent minimum material around the GTLS. The models tested used a screw to attach the front sight to the gun from below the gun's slide. In general, this is the weakest method of attachment to the gun. The rationale was to test this variation because all other models utilize a more secure means of attachment.

2. The prototypes were machined from 12L14, which is a common grade of machinable steel. This grade of steel was selected for testing because it is representative of what we expect to use in production. Currently, we are also considering using 1018 steel for production models. 1018 is readily available and has comparable machining properties to 12L14; however, 1018 can also be case hardened to an Rc of approximately 42, if desired. We believe that the same testing results would be achieved with 1018 as with 12L14. We also believe that the same results would be achieved using a grade of aluminum within the 6000 series, although we do not anticipate using aluminum in production. Please see response 3 below.
3. In our current production of non-tritium gun sights, we have used two grades of aluminum – 6061 and 6063. These are selected because of (i) their ability to be extruded, (ii) their favorable machining and finishing properties, (iii) their ability to resist moistures, (iv) their ability to be heat treated, and (v) their good strength/weight characteristics. We typically use a "T6" heat treatment in our current non-tritium production sights and have not experienced any problems related to these structural materials. Again, we do not currently anticipate using aluminum in the production of the models submitted for approval.

TRUGLO®

13745 Neutron Road

Dallas, Texas 75244

ph: (972) 774 0300

fx: (972) 774 0323

www.truglo.com

WHEN BRIGHTNESS COUNTS

September 11, 2003

Margaret Stambaugh
Nuclear Safety Intern
Materials Safety and Inspection Branch
Division of Industrial and Medical Nuclear Safety
Office of Nuclear Material Safety and Safeguards
United States Nuclear Regulatory Commission
Washington, DC 20555-0001

via FedEx


Re: Request for Amendment to U.S.N.R.C. License No. 42-23889-01E and
Registration Certificate No. NR-1180-D-101-E

Dear Ms. Stambaugh:

This letter is in response to your written request for additional information dated August 27, 2003. We have tried to address each item appropriately and thoroughly to the best of our ability so that the review of our amendment can continue to proceed quickly. Our responses are stated on the following pages.

We appreciate all your help and prompt attention to this matter. If you have any questions, please do not hesitate to contact me at (972) 774-0300. Again, thank you in advance for your time and effort.

Sincerely,


Coraine Hellinghausen
Radiation Safety Officer
TRUGLO, Inc.

Enclosure 1

- 1) During normal use and storage there is no expectation of any radiation dose. This is due to the thickness (0.25 mm) of the borosilicate glass container encapsulating the tritium and the density of the borosilicate glass (2.6 g/cm³). "With one unimportant exception, tritium is the weakest beta emitter known. The range of the most energetic tritium beta particle is only about 5 mm in air or 0.005 mm in water or soft tissue. This range makes it a nonhazard outside the body...." (Source: DOE Handbook - 1079-94, Primer on Tritium Safe Handling Practices, page 13.)

The calculations previously provided are updated below to include 30, 60 and 90 mCi. These calculations generally overstate the actual effects of a failure. An individual user of a gun sight would generally hold the gun at arms length from the body. The actual dose to the user from a failure of a GTLS would be minimized due to the rapid dispersion and dilution of the tritium gas and the distance of the GTLS from the user's body.

Below are calculations for the maximum source strengths. These calculations assume that the entire H-3 content is converted to tritiated water and totally absorbed in a soft tissue mass of 63,000g (ICRP 30). These assumptions are extremely improbable.

Front Sight: $H = 30\text{mCi} \times 6.3 \text{ E-2 rem/mCi} = 1.89\text{rem}$

Rear Sight: $H = 60\text{mCi} \times 6.3 \text{ E-2 rem/mCi} = 3.78\text{rem}$

Front and Rear Sights: $H = 90\text{mCi} \times 6.3 \text{ E-2 rem/mCi} = 6.56\text{rem}$

Below are the same calculations after applying the reduction ratio of 25,000:1 to assume that the entire H-3 content is tritium gas. Such ratio was derived from the DAC (Derived Air Concentration) for elemental tritium compared to the DAC of tritiated water (as previously calculated).

Front Sight: $H = 30\text{mCi} \times 6.3 \text{ E-2 rem/mCi} \times 1/25000 = .076\text{mrem}$

Rear Sight: $H = 60\text{mCi} \times 6.3 \text{ E-2 rem/mCi} \times 1/25000 = .151\text{mrem}$

Front and Rear Sights: $H = 90\text{mCi} \times 6.3 \text{ E-2 rem/mCi} \times 1/25000 = .262\text{mrem}$

Below are intake calculations assuming the GTLS within each sight were broken and converted to oxide within a volume of 2m³ for a period of ten minutes. Following a broken GTLS, the tritium gas would be readily dispersed and diluted. The actual dose would be much less.

Front Sight: $3 \times 10^{-2} \times 30\text{mCi}/2\text{m}^3 \times 3.7 \times 10^7 \text{ Bq/mCi} \times 10 \text{ minutes} = 16.65 \times 10^7 \text{ Bq}$

Applying the dose conversion factor for oxide:

$16.65 \times 10^7 \text{ Bq} \times 1.173 \times 10^{-11} \text{ Sv/Bq} = 1.95 \times 10^{-3} \text{ Sv} = 195\text{mrem}$

Rear Sight: $3 \times 10^{-2} \times 60\text{mCi}/2\text{m}^3 \times 3.7 \times 10^7 \text{ Bq/mCi} \times 10 \text{ minutes} = 33.30 \times 10^7 \text{ Bq}$

Applying the dose conversion factor for oxide:

$33.30 \times 10^7 \text{ Bq} \times 1.173 \times 10^{-11} \text{ Sv/Bq} = 3.90 \times 10^{-3} \text{ Sv} = 390\text{mrem}$

Front and Rear Sights: $3 \times 10^{-2} \times 90\text{mCi}/2\text{m}^3 \times 3.7 \times 10^7 \text{ Bq/mCi} \times 10 \text{ minutes} = 49.95 \times 10^7 \text{ Bq}$

Applying the dose conversion factor for oxide:

$49.95 \times 10^7 \text{ Bq} \times 1.173 \times 10^{-11} \text{ Sv/Bq} = 5.86 \times 10^{-3} \text{ Sv} = 586\text{mrem}$

Assuming an acceptable dose limit of 500mrem, approximately 6,579 30mCi units hypothetically could fail simultaneously. Such a dose assumes the failure creates a cloud of elemental gas and the subjected individual does nothing to reduce the dose, which is extremely improbable and unlikely to occur.

- 2) Because of the construction and design of the device and because there is NO external radiation level relating to the device, the probability is extremely low that the containment, shielding, or other safety features of the product would fail under such circumstances listed in §32.23(d) and cause a person to receive an external radiation dose or dose commitment in excess of the dose to the appropriate organ as specified in Column III of the table in §32.24. For the same reasons, the probability is negligible that a person would receive an external radiation dose or dose commitment in excess of the dose to the appropriate organ as specified in Column IV of the table in §32.24. Also, please note that the use of tritium is in gaseous form contained in borosilicate glass container, not liquid form. Tritium is the weakest beta emitter known. Also, tritium in gaseous form presents no external hazard as the beta can not penetrate the dead layer of skin. "H-3 has a low retention in the body subsequent to inhalation: and the skin absorption intake for H-3 in this form is relatively insignificant." (NUREG/CR-0215)
- 3) The reference to "Model M-1" is incorrect. Such reference should read "SRB Technologies, Inc. -- Model MH." A copy of the referenced license issued by the State of Texas is included herewith as Exhibit A.

Enclosure 2

1. Prototype Testing

- 1.1 Each of the gluing agents listed (a silicone based adhesive, an acrylic adhesives and an elastomer adhesive) were used in the prototype assemblies. A silicone based adhesive is used in the tritium vial assembly (see "Attachment A") and in the sight assemblies (see "Attachment B"). An acrylic adhesive is used in the tritium vial assembly (see "Attachment A"). The elastomer adhesive (referred to as "Loctite Black Max") is used in the sight assemblies (see "Attachment B").
- 1.2 The models tested were selected because they were typical of their respective series. Each model maintains a consistent minimum material around the GTLS. The models tested used a screw to attach the front sight to the gun from below the gun's slide. In general, this is the weakest method of attachment to the gun. The rationale was to test this variation because all other models utilize a more secure means of attachment.
- 1.3 Pursuant to our discussions with Mr. Ashkeboussi on August 2, 2002 regarding the issuance of our License No. 42-23889-01E, it was determined that NUREG Guide 1556, Vol. 8, Sec. 9-10 provides for leak testing through light output and brightness observations. Therefore, visual inspections were completed in compliance with the above reference to ensure source integrity and safety.
- 1.4 The sights were mounted on a steel impact head. The impact head was mounted on a pneumatically powered driver. The driver was mounted at a fixed distance from a rigidly anchored steel stop. The target kinetic energy was acquired by adjusting the pneumatic supply pressure based on the fixed distance between the impact head and the steel stop and the combined piston area of the pneumatic driver cylinders. The governing equation is $KE = F \cdot \Delta s$, where KE = kinetic energy, F = the force applied to the moving portion of the fixture, and Δs = the distance over which the force is exerted. The force applied to the moving portion of the fixture is the product of the total pressurized pneumatic piston area and the supply pressure. The distance over which that force is exerted is the distance between the starting point of the steel impact head and the fixed steel stop.

The recoil calculation is stated below:

Recoil Impulse:

$$RI = (BM \cdot BV + PC \cdot CM) / g \cdot mcoef$$

$$RI = (230 \cdot 925 + 4000 \cdot 9) / 32.17 \cdot 7000 = 1.10$$

Recoil Velocity:

$$RV = g \cdot RI / GM$$

$$RV = 32.17 \cdot 1.10 / 2 = 17.69$$

Recoil Energy:

$$RE = GM \cdot RV^2 / (2 \cdot g)$$

$$RE = 2 \cdot 17.69^2 / (2 \cdot 32.17) = 9.72$$

BM is bullet mass in grains

BV is the bullet muzzle velocity in ft/sec

GM is the gun mass in lbs

CM is the charge mass in grains

g is the gravitational constant, 32.17

PC is the powder gas effective escape velocity constant, 4000

mcoef is 7000 (number of grains in lbs)

2. Documentation

- 2.1 "Attachments D and E" have been revised to show the location of the engraving and are included herewith.

3. Construction and Installation

- 3.1 The gun sight bodies may be constructed of but not limited to steel of a comparable or higher grade than 12L14 or aluminum of a comparable or higher grade than 6000 series. 12L14 generally has a tensile strength of approximately 78 ksi and a Brinell hardness of 163. Series 6000 aluminum alloy generally has a tensile strength of 45 ksi and Brinell hardness of 95. The gun sights were designed to utilize either material, but it is expected that such sights will be machined from steel. The prototypes were machined from 12L14. The silicone based adhesive used on the prototypes is made up of dimethylsiloxane, silica, amorphous, methyltriacetoxysilane, ethyltriacetoxysilane and dimethyl siloxane. The chemical type is acetoxysilicone rubber. This adhesive is non-soluble in water and has a boiling point of more than 300°F. The typical minimum hardness value (ASTM D 2240, Shore A) is 14; the typical minimum tensile strength (ASTM D 638, psi) is 120; the typical minimum elongation value at break (ASTM D 638, %) is 275; and it has a specific gravity of 1.03. The chemical type of the acrylic adhesive is acrylated urethane. The typical minimum hardness value (ASTM D 2240, Shore D) is 64; the typical minimum tensile strength (ASTM D 882, N/mm²) is 23; the typical minimum elongation value at break (ASTM D 882, %) is 265; and it has a specific gravity of 1.10. The chemical type of the elastomer adhesive is ethyl cyanoacrylate. The typical minimum tensile strength (ASTM D 2095, N/mm²) is 12-25; and it has a specific gravity of 1.10.

3.2 Any "modifications to the cosmetic appearance" would in no way be allowed to compromise or alter the means of attachment or the minimum material protection for the GTLS. An example of a change that is incorporated into the drawings is the notation regarding a recessed face. A potential cosmetic change that is not specifically noted in the drawings would be to add or remove a chamfered edge to ease manufacturing or to slightly change the appearance. Such incidental cosmetic modifications may indeed be viewed as necessary to facilitate improvements in the manufacturing process or to satisfy the needs of a customer's demand with particular design criteria for his respective application. Any such change would still be within the dimensions provided in the drawings.

4. Proprietary Information

4.1 "Attachments D and E" have been revised to remove the proprietary designation and are included herewith.



RADIOACTIVE MATERIAL LICENSE

EXHIBIT "A"

Pursuant to the Texas Radiation Control Act and Texas Health Department regulations on radiation, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess and transfer radioactive material listed below; and to use such radioactive material for the purpose(s) and at the place(s) designated below. This license is subject to all applicable rules, regulations and orders of the Texas Department of Health (Agency) now or hereafter in effect and to any conditions specified below.

LICENSEE

This license is issued in response to a letter

Dated: November 5, 2002

Signed by: Lorraine L. Hellinghausen

3. License Number

L05519

Amendment Number

01

PREVIOUS AMENDMENTS ARE VOID

4. Expiration Date

March 31, 2010

RADIOACTIVE MATERIAL AUTHORIZED

5. Radioisotope A. H-3	6. Form of Material A. Sealed source (SRB Technologies, Inc., SRB Model Type MH sealed light source)	7. Maximum Activity* A. No single source to exceed 30 mCi Total: 300 Ci	8. Authorized Use A. Manufacture and storage of archery pins containing self-luminous light sources pending distribution pursuant to U.S. Nuclear Regulatory Commission License No. 42-23889-01E.
B. H-3	B. Sealed source (Lumitec Models CL/1, 5/4, 85, CL/0, 95/3, 3; SRB Tech. Models PRH-800/G/200)	B. No single source to exceed 30 mCi Total: 300 Ci	B. Manufacture and storage of archery pins containing self-luminous light sources pending distribution pursuant to U.S. Nuclear Regulatory Commission License No. 42-23889-01E.
C. H-3	C. Sealed source (MB-Microtec Models 400/1, 400/2 and 400/3)	C. No single source to exceed 30 mCi Total: 300 Ci	C. Manufacture and storage of archery pins containing self-luminous light sources pending distribution pursuant to U.S. Nuclear Regulatory Commission License No. 42-23889-01E.

* Ci-Curies mCi-Millicuries μ Ci-Microcuries

9. Radioactive material shall only be stored and used at:

Site Number

000

Location

Dallas - 13745 Neutron Road

10. Each site shall maintain documents and records pertinent to the operations at that site. Copies of all documents and records required by this license shall be maintained for Agency review at Site 000.

11. The licensee shall comply with the provisions (as amended) of Title 25 Texas Administrative Code (TAC) §289.201, §289.202, §289.203, §289.204, §289.205, §289.251 and §289.252.



RADIOACTIVE MATERIAL LICENSE

LICENSE NUMBER	AMENDMENT NUMBER
L05519	01

12. The individual designated to perform the functions of Radiation Safety Officer (RSO) for activities covered by this license is Lorraine Hellinghausen.
13. Radioactive material shall be used by, or under the direct supervision of, individuals designated by the RSO only after each worker has successfully completed a training course determined by the Agency as appropriate. Documentation verifying the successful completion of the training for each worker shall be maintained by the licensee for inspection by the Agency.
14. Sealed sources containing radioactive material shall not be opened.
15. The licensee shall conduct a physical inventory, at least every six months, to account for all sealed sources received and possessed under the license. The records of the inventories shall be maintained for inspection by the Agency for three years from the date of the inventory and shall include the radionuclide, number of curies, location of each source of radiation, the name of the individual making the inventory, and the date of the inventory.
16. The licensee shall conduct radiation contamination surveys of all radioactive material use and storage areas at intervals not to exceed 30 days or when it is suspected that a tritium light source has become compromised. Surveys shall be taken in the form of surface wipes using appropriate media for subsequent gas proportional counting or liquid scintillation counting. If analysis reveals the presence of radioactive contamination in excess of the limits contained in 25 TAC §289.202(ggg)(6), the licensee shall immediately enable contamination control actions and notify the agency of the analysis findings.
17. Except as specifically provided otherwise by this license, the licensee shall possess and use the radioactive material authorized by this license in accordance with statements, representations, and procedures contained in the following:

application dated January 21, 2002,
 letters dated March 18, 2002 and March 21, 2003.

Title 25 TAC §289 (as amended) shall prevail over statements contained in the above documents unless such statements are more restrictive than the regulations.

DBF:ks

 Date April 18, 2003

FOR THE TEXAS DEPARTMENT OF HEALTH


 David B. Fogle, Chief
 Advanced Technology Licensing Program

10 pages withheld in their entirety –
exemption (b)(4)

Dear Margaret:

Each model maintains at least a certain minimum amount of material around each GTLS (such minimum is noted in the technical drawings). This dimension was based on an analysis of the amount of material necessary to protect the GTLS, while still maintaining a profile that provides the shooter with an acceptable "sight picture." Such analysis was based on the structural properties of the proposed sights, as well as the structural properties of other NRC approved sights already existing in the marketplace utilizing tritium.

Please let me know if this is sufficient to answer your question.

Kindest regards,

Lorraine Hellinghausen

Radiation Safety Officer

Mail Envelope Properties (3F9425E7.AFC : 10 : 11004)

Subject: TRUGLO - Response to Question
Creation Date: 10/20/03 2:13PM
From: "Lorraine Hellinghausen" <lhellinghausen@truglo.com>

Created By: lhellinghausen@truglo.com

Recipients

nrc.gov
twf4_po.TWFN_DO
MXS8 (Margaret Stambaugh)

Post Office

twf4_po.TWFN_DO

Route

nrc.gov

Files

MESSAGE
Part.001
Mime.822

Size

693
7366
9832

Date & Time

10/20/03 02:13PM

Options

Expiration Date: None
Priority: Standard
Reply Requested: No
Return Notification: None

Concealed Subject: No
Security: Standard



**U.S. NUCLEAR
REGULATORY
COMMISSION REQUEST
FOR AMMENDMENT**

PRESENTED TO:

MR. JOHN P. JANKOVICH

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LICENSE #42-23889-01E

ATTACHMENT "F" – TRUGLO REGISTRATION CERTIFICATE

NR-1180-D-101 DATED 11-6-03

ATTACHMENT "G" – RADIOACTIVE MATERIALS LICENSE

FROM TEXAS DEPARTMENT OF

STATE HEALTH SERVICES

ATTACHMENT "H" – PROTOTYPE TESTING



TRUGLO, Inc.
710 Presidential Drive
Richardson, Texas 75081
ph: (972) 774-0300
fx: (972) 774-0323
www.truglo.com

WHEN BRIGHTNESS COUNTS

November 30, 2005

Mr. John P. Jankovich
United States Nuclear Regulatory Commission
Materials Safety and Inspection Branch
Division of Industrial and Medical Nuclear Safety
Office of Nuclear Material Safety and Safeguards
Washington, D.C. 20555-0001

Dear Mr. Jankovich:

Please accept the enclosed documents as a request for an amendment to TRUGLO's existing U.S.N.R.C. License #42-23889-01E and Registration Certificate # NR-1180-D-101-E/Docket or Reference #030-36055. Please note that the purpose of this request for amendment is to add additional similar "aiming sights" to the already existing license. This request for an amendment is believed to have no affect on the original safety evaluation of the device. The intended purpose is to simply broaden the scope of product designs to allow TRUGLO to fulfill market demands and needs.

We once again have followed the original format of the Sealed Source & Device Evaluation & Registration for Certificate # NR-1180-D-101-E in an attempt to present information for the additional "aiming sights" in a concise and efficient manner for your convenience.

In the event that information within a section of these documents remains exactly the same as previously submitted, accepted and approved by the U.S.N.R.C. for TRUGLO's existing license and registration certificate respectively, than the following phrase appears under the particular section in blue ink: "Please refer to the same information as previously submitted, accepted and approved by U.S.N.R.C. for TRUGLO License #42-23889-01E and Registration Certificate # NR-1180-D-101E."

In the event that only part of the information contained within the section of these documents has changed, the "new" or "revised" text appears in "blue" print to distinguish it from the original text submitted by TRUGLO in accordance with the issuance of our current respective license and registration certificate.

TRUGLO, Inc.
710 Presidential Drive
Richardson, Texas 75081
ph: (972) 774-0300
fx: (972) 774-0323
www.truglo.com


WHEN BRIGHTNESS COUNTS

Any section containing only "new" information has all information appearing in "blue" print as well to help distinguish that the information being provided is "new" and pertains to the requested amendment.

No fee has been enclosed with these documents as it remains our understanding that no fee currently applies to this request. Please feel free to contact me with any questions or comments. I can be reached by telephone at 972-774-0300 or e-mail at lhellinghausen@truglo.com.

Thank you in advance for your time and consideration.

Sincerely,
TRUGLO, INC.


Lorraine L. Hellinghausen
Radiation Safety Officer

**APPLICATION FOR AMENDMENT TO
U.S.N.R.C. LICENSE #42-23889-01E
FOR THE APPROVED SEALED SOURCE & DEVICE EVALUATION
& REGISTRATION CERTIFICATE #NR-1180-D-101-E**

NAME & ADDRESS OF APPLICANT:

TRUGLO, INC.
710 PRESIDENTIAL DRIVE
RICHARDSON, TX 75081

INDIVIDUAL TO BE CONTACTED FOR ADDITIONAL INFORMATION:

LORRAINE HELLINGHAUSEN
RADIATION SAFETY OFFICER
972-774-0300
972-774-0323 FAX
lhellinghausen@truglo.com

TRUGLO, INC. is applying to be both the manufacture and distributor of the specified product(s).

PRODUCT NAME USED BY THE INDUSTRY:

The product(s) proposed for the amendment is commonly known in the industry as an "aiming sight" or "gun sight" or "archery pin". A "gun sight" or "archery pin" is considered part of the same category as "aiming sights" which are products distributed to persons exempt from licensing under 10 CFR 30.19.

PRODUCT(S) IS FOR USE BY:

The product(s) proposed for the amendment is intended for use by the recreational sportsman or law enforcement personnel to improve low-light shooting capabilities. It will be sold to the general public.

PRINCIPAL USE CODE:

The principal use code for this product(s) is "W" – Self-Luminous Light Source.

LEAK TEST FREQUENCY:

Please refer to the same information as previously submitted, accepted and approved by U.S.N.R.C. for TRUGLO License #42-23889-01E and Registration Certificate # NR-1180-D-101-E dated 11-12-02.

SEALED SOURCE INFORMATION:

Please refer to the same information as previously submitted, accepted and approved by U.S.N.R.C. for TRUGLO License #42-23889-01E and Registration Certificate # NR-1180-D-101-E dated 11-12-02.

Please note that the manufacturer LUMITEC has been omitted as part of this amendment based upon correspondence received by TRUGLO from Mr. Nima Ashkeboussi of the U.S.N.R.C. on September 20, 2002 stating that sources manufactured by LUMITEC are not registered with the U.S.N.R.C. at this time.

GASEOUS TRITIUM LIGHT SOURCE (GTLS) HYDROGEN-3 (TRITIUM)

All sealed sources suggested for use in this device(s) are approved by the U.S.N.R.C.

SEALED SOURCES FOR THIS DEVICE:

**MB-MICROTECH – MODEL 400/1
UP TO 30 mCi PER SEALED SOURCE
NRC REGISTRY NO: NR-446-S-102-S**

**SRB TECHNOLOGIES, Inc. – MODEL M-1
NRC REGISTRY NO. NC-585-S-102-S
UP TO 30 mCi PER SEALED SOURCE**

MODEL INFORMATION:

The model numbers designated for these products are revisions to the already existing and approved TG20 Series and TG131/TG231-Series Bow and Gun Sights as listed in Registration Certificate # NR-1180-D-101-E amended on 11-6-03.

TG131 SERIES – Revision 1

As already registered, the TRUGLO TG131/231 SERIES consists of front and rear gun sights.

The newly submitted models for this series are related products to TG131 Series only. The TG131 Series – Revision 1 consists of the previously NRC approved TRUGLO patented technology of combining a GTLS with fiber optic material to form an aiming device. The newly submitted device models for the TG131 Series – Revision 1 are as follows:

TG131AR (intended as a front sight on an AR-15 type weapon)
TG131SG (intended as a front sight on a round barrel firearm, such as a shotgun)
TG131ML (intended as a front and rear sight on a firearm)

Front sight proposed to contain one 30 mCi (maximum) GTLS unit.
Rear sight proposed to contain two 30 mCi (maximum) GTLS units.
Maximum of 30mCi per sealed source and maximum of 90mCi per weapon.

TG20 SERIES – Revision 1

The newly submitted device model for the TG20 Series – Revision 1 is as follows:
TG20X (this is a revised design of the already approved TG20 Series – Bow Sights)

TG20X is proposed to contain one 30 mCi (maximum) GTLS unit.

The request for approval of the TG20X does not eliminate the ability for TRUGLO to continue to manufacture and distribute the existing approved TG20 SERIES designed products registered under Registration Certificate # NR-1180-D-101-E amended on 11-6-03 in its entirety.

TRUGLO's intent is to continue to have these model numbers listed as a "series" due to the similarity of the design and construction of the submitted products. The detailed engineering drawings submitted with this application will help illustrate this statement. Please note that the GTLS is protected by at least .019" of material in all designs.

BYPRODUCT MATERIAL INFORMATION:

Please refer to the same information as previously submitted, accepted and approved by U.S.N.R.C. for TRUGLO License #42-23889-01E and Registration Certificate # NR-1180-D-101-E dated 11-12-02 and amended on 11-6-03 in its entirety.

STRUCTURAL MOUNTING OF GTLS:

TRUGLO TG20 SERIES TFO ARCHERY PIN – Revision 1 –

Please note that the procedure for structural mounting of the GTLS is the same procedure as previously submitted, accepted and approved by the U.S.N.R.C. for TRUGLO License #42-2388901E and Registration Certificate #NR-1180-D-101-E dated 11-12-02 and amended in its entirety on 11-6-03. The GTLS in the newly submitted model remains protected in a steel casing.

TRUGLO TG131/231 SERIES - Revision 1 - (Please refer to specified models contained in section MODEL INFORMATION of this application for amendment.)

Please note that the procedure for the structural mounting of the GTLS is the same procedure as previously submitted, accepted and approved by the U.S.N.R.C. for TRUGLO License #42-2388901E Amendment 01 and Registration Certificate #NR-1180-D-101-E amended and re-issued on 11-06-03. The protection of GTLS in the newly submitted models remains uncompromised in each device design respectively.

DEGREE OF ACCESS TO HUMAN BEINGS:

By design, each of the newly proposed devices prevents direct access to the GTLS at any time during normal handling and use by a human being. The GTLS is permanently affixed within the metal "bow and/or gun sight" housings respectively as previously submitted, accepted and approved by the U.S.N.R.C. for TRUGLO License #42-2388901E Amendment 01 and Registration Certificate #NR-1180-D-101-E amended and re-issued on 11-06-03. No compromise has been taken to increase the direct access to human beings.

TOTAL QUANTITY OF BYPRODUCT MATERIAL EXPECTED TO BE DISTRIBUTED ANNUALLY:

TG131 SERIES - Revision 1

The anticipated sales of the newly proposed devices are expected to be approximately 5,000 - 10,000 units in the first year. The 5-10,000 units include all newly proposed device models contained in this application for amendment. A total quantity of 25,000 units is inclusive of all existing and approved models of the TG131 SERIES plus the newly proposed models.

These newly proposed "gun sight" devices are not expected to increase sales beyond the 25,000 units from the already existing models in the marketplace during the first year. Reason being is that existing models in the marketplace to date have not yet exceeded the 25,000 units originally proposed. However, beginning in the second and third years as the new models are accepted into the marketplace, it is anticipated that sales will continue to grow to some extent and possibly exceed the 25,000 units.

Based on a maximum of 90 mCi per front and rear sight combination X 25,000 units, there could be approximately a maximum of 2,250 Curies per year of tritium distributed across the United States in the first year. Again, this amount of tritium remains approved by the U.S.N.R.C. for TRUGLO License #42-2388901E Amendment 01 and Registration Certificate #NR-1180-D-101-E amended and re-issued on 11-06-03. The maximum of 90 mCi per device is calculated by adding together the following:

1 Front Sight containing one 30mCi GTLS + 1 Rear Sight containing two 30mCi GTLS

Please note that front and rear sights are commonly used in combination with each other to complete the sighting device of a firearm. However, it is possible for the firearm to feature only one front sight containing a single GTLS (30mCi) in combination with a traditional non-

illuminated rear sight; or feature only one rear sight containing 2 GTLS (60mCi) and a traditional non-illuminated front sight. Or furthermore, it is possible for firearm such as a shotgun to feature only a front sight containing a single GTLS (30 mCi) and no rear sight at all. In any of the referenced circumstances, the total amount of tritium per device would be lessened and need to be considered in the above equation illustrating the "maximum" set of circumstances at 90mCi per combination of front and rear sight to satisfy the U.S.N.R.C.'s evaluation.

TG20 SERIES – Revision 1

The anticipated sales of the newly proposed device is expected to be approximately 10,000 to 15,000 units in the first year. However, this newly proposed "bow sight" device is not expected to increase sales beyond the originally anticipated 25,000 units from the already existing models in the marketplace during the first year. Reason being is that production of the existing models in the marketplace will likely diminish quickly with the introduction of the newly proposed model, since it is believed the newly proposed model will be more desirable to the marketplace. Beginning in the second and third years as the new model is accepted into the marketplace, it is anticipated that sales will continue to grow to some extent and at that point may exceed the 25,000 total units.

Again, as previously approved by the U.S.N.R.C. for TRUGLO License #42-2388901E Amendment 01 and Registration Certificate #NR-1180-D-101-E amended and re-issued on 11-06-03 based on a maximum of 30 mCi per "bow sight" X 25,000 units, there could be approximately a maximum of 750 Curies per year of tritium distributed across the United States in the first year.

ACTIVITY STORED IN ONE LOCATION:

As previously submitted, accepted and approved in Amendment 01, ideally large quantities of product are not held in stock due to economic considerations and inventory constraints. Product in general is produced on an "as needed" basis to fill orders as efficiently as possible without the burden of having excess inventory.

Again, based on a combination of considering already registered devices and other types of tritium illuminated aiming devices that TRUGLO is proposing in this application for amendment, although unlikely, it is estimated that the maximum activity to be stored at any one time contained in exempt devices would still not exceed 750 Ci. For example purposes only, consider that this would allow for 5,000 front and rear gun sight combinations at a maximum of 90 mCi per set for a total of 450 Ci, as well as 10,000 bow sights at a maximum of 30mCi each for a total of 300 Ci to accumulate in one location at a given point in time for a grand total of 750Ci. To date in practicum, TRUGLO has yet to reach this hypothetical grand total of 750Ci.

Also as previously submitted, accepted and approved in Amendment 01, the hypothetical "maximum" grand total of 750 Ci is unlikely due to the fact that the combination of the bow and gun sights devices are "seasonal" items are not demanded by the marketplace during the same time of year.

CONDITIONS OF USE:

All information for this section remains exactly the same as previously approved by the U.S.N.R.C. for TRUGLO License #42-2388901E Amendment 01 and Registration Certificate #NR-1180-D-101-E amended and re-issued on 11-06-03 for both TG20 SERIES Bow Sights and TG131/231 SERIES gun sights.

Again, normal use of the newly proposed devices for both TG20 SERIES – Revision 1 and TG131/231 SERIES – Revision 1 is by the recreational hunter or target shooter (general public) or possible law enforcement personnel. The likely environment remains to be the outdoors. Since the tritium illuminated aiming devices remain attached for example to a firearm or bow, they are only in close proximity to the shooter on a limited basis.

No accident conditions can be thought of with the exception of the firearm or bow/crossbow being dropped to the ground from the hands of a person standing on the ground. Damage to the actual GTLS is estimated to be a very remote chance since the actual firearm/bow would take the impact of the fall to the ground. Firearms and bows/crossbows in general are designed to withstand compromising circumstances such as falls or drops to the ground although not recommended. Submitted prototype testing confirmed that the GTLS was not compromised in any way when subjected to possible accident conditions.

EXTREME CONDITIONS:

All information for this section remains exactly the same as previously approved by the U.S.N.R.C. for TRUGLO License #42-2388901E Amendment 01 and Registration Certificate #NR-1180-D-101-E amended and re-issued on 11-06-03 for both TG20 SERIES Bow Sights and TG131/231 SERIES gun sights.

Again, the proposed devices will not be subject to any extreme conditions as listed under Section 10.2 "Conditions of Use" of the NUREG-1556 Volume 3 since it will always be in the possession of the person handling the firearm or bow/crossbow. Firearms, bows/crossbows even in the absence of the proposed tritium aiming devices must be handled with care to avoid unwanted and unexpected adjustments to the equipment; especially the bow or gun sight itself that will directly affect the accuracy and performance of the firearm.

ESTIMATED WORKING LIFE OF THE DEVICE:

All information for this section remains exactly the same as previously approved by the U.S.N.R.C. for TRUGLO License #42-2388901E Amendment 01 and Registration Certificate #NR-1180-D-101-E amended and re-issued on 11-06-03 for both TG20 SERIES Bow Sights and TG131/231 SERIES gun sights.

Due to the radioactive nature of tritium and its radioactivity decay half-life of 12.3 years, the amount of tritium decreases with time. Tritium can also diffuse slowly through glass causing the brightness of the GTLS to dim over time. However, the estimated working life of the device is indefinite. Even if the tritium source expires and dims to the point that there is no

visible illumination by the tritium, the fiber-optic material used in combination with the expired tritium source allows the aiming device to possess an indefinite life span. The fiber optic material can continue to be used as the aiming point for the firearm or bow/crossbow even in the absence of the illuminating properties of the tritium component. Even at this point, the aiming device is still completely functional and is considered competitive with existing aiming device technologies. Thus, both the already approved and newly proposed devices have an indefinite working life-span.

Again, TRUGLO anticipates the working life of the devices to be indefinite and the decay half-life of the tritium in 12.3 years. This statement is confirmed with the fact that even in the absence of the illuminating ability of the tritium, the fiber-optic material can continue to be used as the aiming point for the firearm or bow/crossbow.

MAXIMUM EXTERNAL RADIATION LEVELS AS REFERRED TO IN 10 CFR 32.22 (a)(2)(vi):

All information for this section remains exactly the same as previously approved by the U.S.N.R.C. for TRUGLO License #42-2388901E Amendment 01 and Registration Certificate #NR-1180-D-101-E amended and re-issued on 11-06-03 for both TG20 SERIES Bow Sights and TG131/231 SERIES gun sights.

CONSTRUCTION OF THE PRODUCT:

The contained documents illustrate the construction of the proposed archery pin and gun sights:

TG20 SERIES – Revision 1
TG20X – Attachment A, pages 1-2.

TG131 SERIES – Revision 1
TG131AR – Attachment B, pages 3-4.
TG131SG – Attachment C, pages 5-6.
TG131ML – Attachment D, pages 7-10.

Certain tolerances (such as dovetail dimensions) are considered as variations in shape or size and are contained in these drawings to be considered as part of the SERIES. Such variations are referenced for your convenience on the drawings.

Again, please note that small modifications to the cosmetic or aesthetic appearance ONLY of various metal sight housings may be implemented by TRUGLO, Inc. at a point in time to better suit market demand and/or customer needs and satisfaction.

MATERIALS USED IN CONSTRUCTION OF THE PRODUCT:

Materials used in the construction of the products are stated on the submitted product drawings of the proposed aiming devices.

All materials used are the same as previously approved by the U.S.N.R.C. for TRUGLO License #42-2388901E Amendment 01 and Registration Certificate #NR-1180-D-101-E amended and re-issued on 11-06-03 for both TG20 SERIES Bow Sights and TG131 SERIES gun sights.

The materials are re-capped as follows for your convenience:

1. BOW OR GUN SIGHT BODY: Materials such as but not limited to: Steel or Aluminum.
2. BOW OR GUN SIGHT FIBER: (Applicable to TG131/TG20 TRITIUM FIBER OPTIC SERIES only.) Fluorescent plastic fiber.
3. TRITIUM VIAL ASSEMBLY: GTLS and structural mounting bracket.
4. GLUING AGENTS: Such as but not limited to: silicone based adhesives, clear optical glue (acrylic adhesives), elastomer adhesive such as but not limited to trade name "Black Max" by Loc-Tite and/or epoxy.

LABELING:

All information for this section remains exactly the same as previously approved by the U.S.N.R.C. for TRUGLO License #42-2388901E Amendment 01 and Registration Certificate #NR-1180-D-101-E amended and re-issued on 11-06-03 for both TG20 SERIES Bow Sights and TG131/231 SERIES gun sights.

As stated in the actual Registration #NR-1180-D-101-E, since it is not physically possible to mark or label the GTLS itself, "Each sight is permanently marked with "TG" and the symbol for tritium (H-3). The logo and H-3 are marked on the side of the bow sight pins and the gun sights. The preferred method of labeling still remains to be laser engraving. However, TRUGLO is not limited to considering other permanent methods of labeling in the future as technology becomes accessible or available. In addition, packaging of the device will contain information identifying the fact that the device contains tritium gas along with the proper instruction for the return of an unwanted device or defective product back to the manufacturer for disposal."

PROTOTYPE TESTING of PROPOSED GTLS SOURCES:

All information for this section remains exactly the same as previously approved by the U.S.N.R.C. for TRUGLO License #42-2388901E Amendment 01 and Registration Certificate #NR-1180-D-101-E amended and re-issued on 11-06-03 for both TG20 SERIES Bow Sights and TG131/231 SERIES gun sights.

PROTOTYPE TESTING OF PROPOSED DEVICE:

TRUGLO performed the following prototype tests for all sights: chemical, temperature, humidity, temperature shock, vibration, pressure, penetration, and mechanical shock.

All prototype testing was conducted in accordance with NUREG-1556, Vol. 8, Appendix "O" as required. Prototype testing was performed to show the product's integrity in protecting the GTLS from damage or destruction. Please note that there is no external radiation hazard from tritium. No structural degradation of the "bow or gun sight" or structural mounting bracket containing the GTLS is anticipated.

As previously identified, tritium decays with a characteristic half-life of 12.3 years. Tritium is known to slowly diffuse through glass and can oxidize to tritium oxide in the atmosphere.

Each sample was visually inspected between each test and after completion of all the tests to ensure that no detrimental effects occurred. The prototype testing exhibited NO tritium leakage or breakage of the sight or source. Please see Attachment H for information regarding prototype testing.

ESTIMATED EXTERNAL RADIATION DOSES & RADIATION DOSES RELEVANT TO 10 CFR32.23 & 32.24:

All information for this section remains exactly the same as previously approved by the U.S.N.R.C. for TRUGLO License #42-2388901E Amendment 01 and Registration Certificate #NR-1180-D-101-E amended and re-issued on 11-06-03 for both TG20 SERIES Bow Sights and TG131/231 SERIES gun sights.

QUALITY ASSURANCE AND CONTROL:

All information for this section remains exactly the same as previously approved by the U.S.N.R.C. for TRUGLO License #42-2388901E Amendment 01 and Registration Certificate #NR-1180-D-101-E amended and re-issued on 11-06-03 for both TG20 SERIES Bow Sights and TG131/231 SERIES gun sights.

As stated in Registration #NR-1180-D-101-E, "TRUGLO, Inc. has submitted a quality assurance and control (QA/QC) program that has been found to be acceptable by the NRC for the production and distribution of the TG-20, TG131 and TG231 SERIES sights by TRUGLO. A copy of this program is on file with the NRC."

ATTACHMENT "A"

**TG20 SERIES
REVISION 1**

TG20X

13 pages withheld in their entirety –
exemption (b)(4)

U.S. NUCLEAR REGULATORY COMMISSION

Amendment No. 03

MATERIALS LICENSE

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 36, 39, 40, and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations, and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

ATTACHMENT "E"

Licensee

1. TRUGLO, Inc.
2. 710 Presidential Drive
Richardson, TX 75081

In accordance with letter dated
June 17, 2005

3. License number 42-23889-01E is amended in
its entirety to read as follows:

4. Expiration date November 30, 2012

5. Docket No. 030-36055
Reference No.

6. Byproduct, source, and/or special
nuclear material

A. Hydrogen - 3

7. Chemical and/or physical form

A. Sealed self-luminous light
sources (SFLS)
Technologies Model M-1
and M-1 Proton Model
4004

8. Maximum amount that licensee may
possess at any one time under this
license

A. Not applicable
(See Condition 11)

9. Authorized use:

Pursuant to Section 32.22, 10 CFR Part 32, Specific Domestic Licenses to Manufacture or Transfer Certain Items Containing Byproduct Material, the licensee is authorized to distribute sealed self-luminous light sources in archery pins and gun sights as specified in Condition 10 of this license to persons exempt from the requirements for a license pursuant to Section 30.19, 10 CFR Part 30, or equivalent provisions of the regulations of any Agreement State.

CONDITIONS

10. The licensee is authorized to distribute the following series of self-luminous archery pin and gun sight devices:

Device ModelMaximum Activity

TG-20 Series (Bow Sights)

30 millicuries (1110 MBq) per bow sight

TG-131 Series (Gun Sights)

90 millicuries (3330 MBq) per gun sight device

TG-231 Series (Gun Sights)

90 millicuries (3330 MBq) per gun sight device


**MATERIALS LICENSE
SUPPLEMENTARY SHEET**License Number
42-23889-01EDocket or Reference Number
030-36055

Amendment No. 03

CONDITIONS

(Continued)

11. This license does not authorize possession or use of licensed material.
12. Licensed material shall be distributed only from the licensee's facility located at 710 Presidential Drive, Richardson, TX 75081.
13. The licensee shall file periodic reports as specified in 10 CFR 32.25(c).
14. Except as specifically provided otherwise by this license, the licensee shall conduct its program in accordance with the statements, representations, and procedures contained in the documents, including any enclosures, listed below. The U.S. Nuclear Regulatory Commission's regulations shall govern unless the statements, representations and procedures in the licensee's application and correspondence are more restrictive than the regulations:
- A. Application dated June 12, 2002;
 - B. Letter dated August 29, 2002;
 - C. Letter dated September 26, 2002;
 - D. Letter dated May 20, 2003;
 - E. Letter dated September 11, 2003;
 - F. Letter dated October 14, 2003;
 - G. Letter dated January 25, 2005;
 - H. Letter dated June 17, 2005; and,
 - I. Registration Certificate No. NR-1180-D-101-E.

FOR THE U.S. NUCLEAR REGULATORY COMMISSIONDate: 8/11/05
Jonathan Rivera
Materials Safety and Inspection Branch
Division of Industrial and
Medical Nuclear Safety
Office of Nuclear Material Safety
and Safeguards
Washington, DC 20555

ATTACHMENT "F"

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES SAFETY EVALUATION OF DEVICE (AMENDED IN ITS ENTIRETY)

NO.: NR-1180-D-101-E DATE: November 6, 2003 PAGE 1 OF 5

DEVICE TYPE: Bow and Gun Sights

MODELS: TG-20 Series (bow sights)
 TG-131 and TG-231 Series (gun sights)

MANUFACTURER/DISTRIBUTOR: TRUGLO, Inc.
 13745 Neutron Road
 Dallas, TX 75244

SEALED SOURCE MODEL DESIGNATION: SRB Technologies, Model M-1
 Mb-Microtec, Model 400/1

<u>ISOTOPE:</u>	<u>MAXIMUM ACTIVITY:</u>
Hydrogen-3	30 millicuries (1110 MBq) per bow sight 90 millicuries (3330 MBq) per gun sight device (3x30 millicuries)

LEAK TEST FREQUENCY: Not required

PRINCIPAL USE: (W) Self-Luminous Light Source

CUSTOM DEVICE: _____ YES ☒ X NO

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE
(AMENDED IN ITS ENTIRETY)

NO.: NR-1180-D-101-E

DATE: November 6, 2003

PAGE 2 OF 5

DEVICE TYPE: Bow and Gun Sights

DESCRIPTION:

The TG-20 Series bow sights are primarily used by recreational hunters or target shooters to improve low-light shooting capability. The sight pins are mounted on archery sights and affixed to the bow. Likewise, the TG-131 and TG-231 gun sights are primarily used by recreational hunters or law enforcement personnel to improve low-light shooting capability. The front and rear gun sights are secured in a structural mounting and affixed to a gun.

The by-product material is tritium (H-3) in gaseous form, sealed into borosilicate glass tubes. The sources used are Mb Microtec Model 400/1 (NRC registration certificate NR-0446-S-102-S) or SRB Technology, Inc. Model M-1 registration certificate NC-0585-S-102-S. The manufacturer states that if the working life of a sight is indefinite, the decay half-life of tritium is 12.3 years. Each archery pin or front gun sight contains one source with a maximum activity of 30 mCi (1110 MBq). A rear gun sight may contain two sources, 30 mCi (1110 MBq) each, with a maximum combined activity of 60 mCi (2220 MBq). An individual gun may use one front and one rear sight, for a maximum combined activity of 90 mCi (3330 MBq).

In bow sights, the gaseous tritium light source (GTLS) units are placed in a structural mounting bracket of plastic tubing which is inserted into a steel casing. A gluing agent is used to permanently affix the plastic tubing in the steel casing. The sources are inaccessible to the user. The sight is mounted to the bow by means of a screw/clamp connection. The overall dimensions for the bow sight are 1.2 inches (3cm) in length and 0.2 inches (0.5 cm) in width.

The TG-20 Series bow sights consist of three models. The difference between the three models is the shape of the base. The base may be square, rectangular, or round.

In gun sights, the GTLS units are placed in a structural mounting bracket of plastic tubing. A silicone gluing agent, acetoxy silicone rubber or equivalent, is used to permanently affix the

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE
(AMENDED IN ITS ENTIRETY)

NO.: NR-1180-D-101-E

DATE: November 6, 2003

PAGE 3 OF 5

DEVICE TYPE: Bow and Gun Sights

DESCRIPTION (cont.):

GTLS in the plastic tubing. An acrylated urethane adhesive creates a lens at the end of the GTLS assembly. The plastic tubing and GTLS assembly is inserted into a metal gun sight housing. The housing is machined from 12L14 steel, or metal of equivalent physical and chemical properties, with a minimum wall thickness of 0.019 inches (0.048 cm). A silicone gluing agent affixes the GTLS to the metal housing. Finally, the GTLS is sealed in the metal housing with an elastomeric adhesive to make the sources inaccessible to the user. The maximum dimensions of a front gun sight are 1.3 inches (3.3 cm) length, 0.37 inches (0.94 cm) width and 0.78 inches (2.0 cm) height. The maximum dimensions of a rear gun sight are 1.3 inches (3.3 cm) length, 1.2 inches (3.0 cm) width and 0.88 inches (2.2 cm) height.

There are five models in the TG-131 and TG-231 Series gun sights. In both series Models A1, A2 and A3 are front gun sights, containing one radioactive source, while B1 and B2 are rear gun sights containing two radioactive sources. Differing models have screw/clamp, stake, or dovetail mounting connection. The TG-131 Series contains a fiber-optic cable and the TG-231 Series does not.

LABELING:

Each sight is permanently marked with the TRUGLO logo "TG" and the symbol for tritium (H-3). The logo and H-3 are marked on the side of the bow sight pins and gun sights. In addition, packaging of the device will contain information identifying the fact that the device contains tritium gas along with the proper instruction for the return of an unwanted device or defective product back to the manufacturer for disposal.

DIAGRAMS:

See Attachments 1, 2, 3, 4, and 5.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE
(AMENDED IN ITS ENTIRETY)

NO.: NR-1180-D-101-E DATE: November 6, 2003 PAGE 4 OF 5

DEVICE TYPE: Bow and Gun Sights

PROTOTYPE TESTING:

Truglo performed the following prototype tests for all sights: temperature, humidity, temperature shock, pressure, penetration, and mechanical shock. In addition, vibration and firing tests were performed to establish the integrity of the gun sights.

The same sight pins were used for each test of the TG-20 Series. Five sets of sights from each of the two gun sight series, TG-131 and TG-231, were tested. A test set included two sights: one front sight (Model A1) and one rear sight (Model B1). Each of the gun sights tested used a stake mounting connection. Each sight was visually inspected between each test and after completion of all the tests to ensure that no detrimental effects occurred. The prototype testing exhibited no tritium leakage or breakage of the sight or source.

QUALITY ASSURANCE AND CONTROL:

TRUGLO, Inc. has submitted a quality assurance and control (QA/QC) program that has been found to be acceptable by NRC for the production and distribution of the TG-20, TG-131, and TG-231 Series sights by TRUGLO. A copy of this program is on file with the NRC.

SAFETY ANALYSIS SUMMARY:

Based on our review of the information provided and the test data cited above, we conclude that TRUGLO, Inc.'s TG-20 bow sight and TG-131 and TG-231 Series gun sight models meet the safety criteria set forth in 10 CFR 32.23. Furthermore, we conclude that the TG-20, TG-131 and TG-231 Series' sealed tritium light sources would maintain containment integrity under normal conditions and accidental conditions of use. Therefore, we conclude that the TG-20 bow sights and TG-131 and TG-231 Series gun sights are acceptable for exempt licensing purposes.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE
(AMENDED IN ITS ENTIRETY)

NO.: NR-1180-D-101-E

DATE: November 6, 2003

PAGE 5 OF 5

DEVICE TYPE: Bow and Gun Sights

REFERENCES:

The following supporting documents for TRUGLO, Inc. bow and gun sights are hereby incorporated by reference and are made a part of this registry document.

- TRUGLO, Inc. device registration and exempt materials license applications dated June 12, 2002, with enclosures thereto.
- TRUGLO, Inc. letters dated August 29, 2002 and September 26, 2002.
- TRUGLO, Inc. device registration and exempt materials license amendment applications dated May 20, 2003, with enclosures thereto.
- TRUGLO, Inc., letters dated September 11, 2003, and October 14, 2003, with enclosures thereto.
- TRUGLO, Inc., electronic mails dated October 11, 2003, October 15, 2003, October 20, 2003, and October 28, 2003, with enclosures thereto.

ISSUING AGENCY:

U.S. Nuclear Regulatory Commission

Date: November 6, 2003

Reviewer: John P. Jankovich

John P. Jankovich

Date: November 6, 2002

Concurrence: Ujagar S. Bhachu

Ujagar S. Bhachu

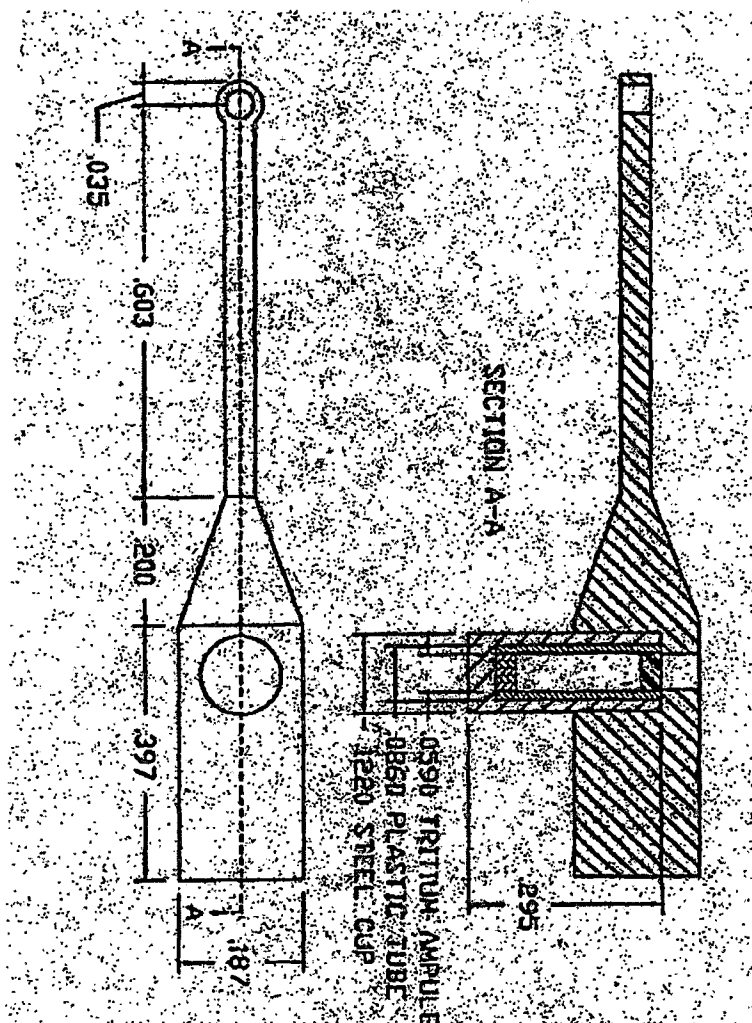
REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE
(AMENDED IN ITS ENTIRETY)

NO.: NR-1180-D-101-E

DATE: November 6, 2003

ATTACHMENT 1

DEVICE TYPE: Bow and Gun Sights



TG-20 Series Bow Sight

4 pages withheld in their entirety –
exemption (b)(4)



ATTACHMENT "G"

Department of State Health Services

RADIOACTIVE MATERIAL LICENSE

Pursuant to the Texas Radiation Control Act and Texas Department of State Health Services (Agency) regulations on radiation, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess and transfer radioactive material listed below; and to use such radioactive material for the purpose(s) and at the place(s) designated below. This license is subject to all applicable rules, regulations and orders of the Agency now or hereafter in effect and to any conditions specified below.

LICENSEE

1. Name **TRUGLO INC**
ATTN LORRAINE L HELLINGHAUSEN
2. Address **710 PRESIDENTIAL DRIVE**
RICHARDSON TX 75081

This license is issued in response to a letter

Dated: **June 8, 2005**

Signed by: **Lorraine L. Hellinghausen**

3. License Number

L05519

Amendment Number

03

PREVIOUS AMENDMENTS ARE VOID

4. Expiration Date

March 31, 2010

RADIOACTIVE MATERIAL AUTHORIZED

5. Radioisotope	6. Form of Material	7. Maximum Activity*	8. Authorized Use
A. H-3	A. Sealed source (SRB Technologies, Inc., SRB Model Type MH sealed light source)	A. No single source to exceed 30 mCi Total: 300 Ci	A. Manufacture and storage of archery pins containing self-luminous light sources pending distribution pursuant to U.S. Nuclear Regulatory Commission License No. 42-23889-01E.
B. H-3	B. Sealed source (Lumitec Models CL/1, 5/4, 85, CL/0, 95/3, 3; SRB Tech. Models PRH-800/G/200)	B. No single source to exceed 30 mCi Total: 300 Ci	B. Manufacture and storage of archery pins containing self-luminous light sources pending distribution pursuant to U.S. Nuclear Regulatory Commission License No. 42-23889-01E.
C. H-3	C. Sealed source (MB-Microtec Models 400/1, 400/2 and 400/3)	C. No single source to exceed 30 mCi Total: 300 Ci	C. Manufacture and storage of archery pins containing self-luminous light sources pending distribution pursuant to U.S. Nuclear Regulatory Commission License No. 42-23889-01E.

* Ci-Curies mCi-Millicuries μ Ci-Microcuries

9. Radioactive material shall only be stored and used at:

Site Number
001

Location
Richardson - 710 Presidential Drive

10. Each site shall maintain documents and records pertinent to the operations at that site. Copies of all documents and records required by this license shall be maintained for Agency review at Site 001.

11. The licensee shall comply with the provisions (as amended) of Title 25 Texas Administrative Code (TAC) §289.201, §289.202, §289.203, §289.204, §289.205, §289.251 and §289.252.



Department of State Health Services

RADIOACTIVE MATERIAL LICENSE

LICENSE NUMBER	AMENDMENT NUMBER
L05519	03

12. The individual designated to perform the functions of Radiation Safety Officer (RSO) for activities covered by this license is Lorraine L. Hellinghausen.
13. Radioactive material shall be used by, or under the direct supervision of, individuals designated by the RSO only after each worker has successfully completed a training course determined by the Agency as appropriate. Documentation verifying the successful completion of the training for each worker shall be maintained by the licensee for inspection by the Agency.
14. Sealed sources containing radioactive material shall not be opened.
15. The licensee shall conduct a physical inventory, at least every six months, to account for all sealed sources received and possessed under the license. The records of the inventories shall be maintained for inspection by the Agency for three years from the date of the inventory and shall include the radionuclide, number of curies, location of each source of radiation, the name of the individual making the inventory, and the date of the inventory.
16. The licensee shall conduct radiation contamination surveys of all radioactive material use and storage areas at intervals not to exceed 30 days or when it is suspected that a tritium light source has become compromised. Surveys shall be taken in the form of surface wipes using appropriate media for subsequent gas proportional counting or liquid scintillation counting. If analysis reveals the presence of radioactive contamination in excess of the limits contained in 25 TAC §289.202(ggg)(6), the licensee shall immediately enable contamination control actions and notify the agency of the analysis findings.
17. Except as specifically provided otherwise by this license, the licensee shall possess and use the radioactive material authorized by this license in accordance with statements, representations, and procedures contained in the following:

application dated January 21, 2002,
letters dated March 18, 2002, March 21, 2003, and January 25, 2005.

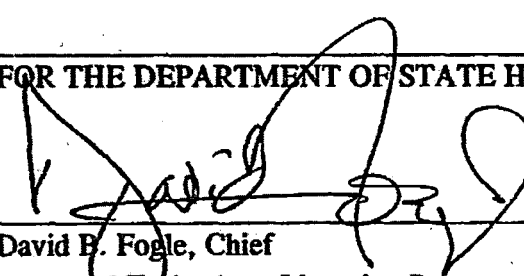
Title 25 TAC §289 (as amended) shall prevail over statements contained in the above documents unless such statements are more restrictive than the regulations.

DBF:sj

FOR THE DEPARTMENT OF STATE HEALTH SERVICES

Date

July 20, 2005


David B. Fogle, Chief
Advanced Technology Licensing Program

Attachment H

The prototype testing for the TG-131 and TG-20 Series pursuant to 10 CFR 32.22 is listed below. Five sets of sights from each series were subjected to the tests below. Each sight was visually inspected between each test and after completion of all tests, to ensure that no detrimental effects had occurred to the GTLS. In summary, all sights passed. Visual inspections conducted in a darkroom, showed no reduction in light output or brightness. Pursuant to our discussions with Mr. Ashkeboussi on August 2, 2002 regarding the issuance of our License No. 42-23889-01E, it was determined that NUREG Guide 1556, Vol. 8, Sec. 9-10 provides for leak testing through light output and brightness observations. Therefore, visual inspections were completed in compliance with the above reference to ensure source integrity and safety.

Chemical. Each sight was immersed for 48 hours at room temperature in each of the following (i) gun oil, (ii) a cleaning compound that contained trichloroethylene and (iii) a cleaning compound according to MIL-C-372B.

Temperature. The following tests were performed on each sight:

High Temperature. The temperature of the sights were raised from ambient to 120°C and held at such temperature for one hour.

Low Temperature. The temperature of the sights was lowered from ambient to -46°C and held at such temperature for 48 hours.

Humidity. The sights were placed in an environment of 100% relative humidity and a temperature of 42°C and held in such environment for 48 hours.

Temperature Shock. The temperature of each sight was raised to 80°C and held at this temperature for 15 minutes. The sights were then transferred (within 15 seconds) to a cold chamber having a temperature of -46°C and held in this chamber for 15 minutes.

Vibration. Each sight was subjected to 10 cycles of simple harmonic motion having amplitude of 0.075 cm starting at 10 Hz, rising to 50 Hz, and decreasing back to 10 Hz in approximately one minute. In addition, each sight was subjected to a 30-minute cycle at 100 Hz. These tests were conducted in three planes.

Pressure. Each sight was placed in a test chamber and exposed to 0.25 and 2.0 bars for 4 periods of 15 minutes each. The pressure was returned to atmosphere between each period.

Penetration. A 13 gram weight with a small point was dropped from a height of at least one meter onto the exposed surface of the light source.

Mechanical Shock.

Gun sights: This test was performed with the sights attached to the gun. The gun was then dropped from two meters onto a mat with a durometer of approximately 95 over a concrete floor. The gun was dropped at least 60 times in such a manner that it struck the surface at least ten times in each of the following attitudes: (i) barrel vertical (upright), (ii) barrel vertical (inverted), (iii) barrel horizontal (front up), (iv) barrel horizontal (front down), (v) barrel horizontal (left side up) and (vi) barrel horizontal (right side up).

Archery sights: This test was performed with the sight pin attached to the archery bow. The bow was then dropped from two meters onto a mat with a durometer of approximately 95 over a concrete floor. The bow was dropped at least 60 times in such a manner that it struck the surface at least ten times in each of the following attitudes: (i) bow vertical (upright), (ii) bow vertical (inverted), (iii) bow horizontal (front up), (iv) bow horizontal (front down), (v) bow horizontal (left side up) and (vi) bow horizontal (right side up).

Firing. Although firing tests were not required for TG20 Series in connection with the issuance of our License No. 42-23889-01E, TG20X was also subjected to the following test. This test was performed using a mechanical "impact" device fabricated to impart on the sights a kinetic energy of 55 ft-lbs. The sights were attached to a fixture that reproduced the effects of firing. Two sets of sights from each series were each continuously cycled 10,000 times on the fixture. For reference, a 45 caliber handgun weighing two pounds and firing a 230 grain bullet produces recoil of approximately 10 ft-lbs.

The recoil calculation is stated below:

Recoil Impulse:

$$RI = (BM \cdot BV + PC \cdot CM) / g \cdot mcoef$$

$$RI = (230 \cdot 925 + 4000 \cdot 9) / 32.17 \cdot 7000 = 1.10$$

Recoil Velocity:

$$RV = g \cdot RI / GM$$

$$RV = 32.17 \cdot 1.10 / 2 = 17.69$$

Recoil Energy:

$$RE = GM \cdot RV^2 / (2 \cdot g)$$

$$RE = 2 \cdot 17.69^2 / (2 \cdot 32.17) = 9.72$$

BM is bullet mass in grains

BV is the bullet muzzle velocity in ft/sec

GM is the gun mass in lbs

CM is the charge mass in grains

g is the gravitational constant, 32.17

PC is the powder gas effective escape velocity constant, 4000

mcoef is 7000 (number of grains in lbs)

The word "TRUGLO" is rendered in a bold, blocky, sans-serif font. The letters are filled with a dense, stippled or pixelated pattern, giving it a textured, almost metallic appearance. The logo is centered within a solid black rectangular background.

**U.S. NUCLEAR
REGULATORY
COMMISSION REQUEST
FOR AMMENDMENT**

PRESENTED TO:

MR. JOHN P. JANKOVICH



TRUGLO,® Inc.

710 Presidential Drive

Richardson, Texas 75081

ph: (972) 774-0300

fx: (972) 774-0323

www.truglo.com

WHEN BRIGHTNESS COUNTS

March 8, 2010

Mr. John P. Jankovich
United States Nuclear Regulatory Commission
Materials Safety and Inspection Branch
Division of Industrial and Medical Nuclear Safety
Office of Nuclear Material Safety and Safeguards
Washington, D.C. 20555-0001

Dear Mr. Jankovich:

Please accept the enclosed documents as a request for an amendment to TRUGLO's existing U.S.N.R.C. License #42-23889-01E and Registration Certificate # NR-1180-D-101-E/Docket or Reference #030-36055. Please note that the sole purpose of this request for amendment is simply to broaden the scope of models to the already existing "aiming sights" approved and included on TRUGLO's existing license. The request for this amendment has no affect on the original safety evaluation of the device. The intended purpose is to simply broaden the scope of approved models to allow TRUGLO to fulfill market demands and needs.

We once again have followed the original format of the Sealed Source & Device Evaluation & Registration for Certificate # NR-1180-D-101-E in an attempt to present information for the additional "aiming sights" in a concise and efficient manner for your convenience.

In the event that information within a section of these documents remains exactly the same as previously submitted, accepted and approved by the U.S.N.R.C. for TRUGLO's existing license and registration certificate respectively, than the following phrase appears under the particular section in blue ink: "Please refer to the same information as previously submitted, accepted and approved by U.S.N.R.C. for TRUGLO License #42-23889-01E and Registration Certificate # NR-1180-D-101E."

In the event that only part of the information contained within the section of these documents has changed, the "new" or "revised" text appears in "blue" print to distinguish it from the original text submitted by TRUGLO in accordance with the issuance of our current respective license and registration certificate.

TRUGLO
TRUGLO,® Inc.
710 Presidential Drive
Richardson, Texas 75081
ph: (972) 774-0300
fx: (972) 774-0323
www.truglo.com

WHEN BRIGHTNESS COUNTS

Any section containing only "new" information has all information appearing in "blue" print as well to help distinguish that the information being provided is "new" and pertains to the requested amendment.

No fee has been enclosed with these documents as it remains our understanding that no fee currently applies to this request. Please feel free to contact me with any questions or comments. I can be reached by telephone at 972-774-0300 or e-mail at lhellinghausen@truglo.com.

Thank you in advance for your time and consideration.

Sincerely,
TRUGLO, INC.


Lorraine L. Hellinghausen
Radiation Safety Officer

TABLE OF CONTENTS

SECTIONS

SECTION I – LETTER

SECTION II – REQUEST FOR AMMENDMENT

ATTACHMENTS

ATTACHMENT "A" – TG131MPT

ATTACHMENT "B" – TG231MP

ATTACHMENT "C" – TRUGLO REGISTRATION CERTIFICATE
NR-1180-D-101 DATED 2-15-06

ATTACHMENT "D" – U.S.N.R.C. MATERIALS
LICENSE #42-23889-01E

ATTACHMENT "E" – RADIOACTIVE MATERIALS LICENSE
FROM TEXAS DEPARTMENT OF
STATE HEALTH SERVICES

APPLICATION FOR AMENDMENT TO
U.S.N.R.C. LICENSE #42-23889-01E
FOR THE APPROVED SEALED SOURCE & DEVICE EVALUATION
& REGISTRATION CERTIFICATE #NR-1180-D-101-E

NAME & ADDRESS OF APPLICANT:

TRUGLO, INC.
710 PRESIDENTIAL DRIVE
RICHARDSON, TX 75081

INDIVIDUAL TO BE CONTACTED FOR ADDITIONAL INFORMATION:

LORRAINE HELLINGHAUSEN
RADIATION SAFETY OFFICER
972-774-0300
972-774-0323 FAX
lhellinghausen@truglo.com

TRUGLO, INC. is applying to be both the manufacture and distributor of the specified product(s).

PRODUCT NAME USED BY THE INDUSTRY:

The product(s) proposed for the amendment is commonly known in the industry as an "aiming sight" or "gun sight". A "gun sight" is considered part of the same category as "aiming sights" which are products distributed to persons exempt from licensing under 10 CFR 30.19.

PRODUCT(S) IS FOR USE BY:

The product(s) proposed for the amendment is intended for use by the recreational sportsman or law enforcement personnel to improve low-light shooting capabilities. It will be sold to the general public.

PRINCIPAL USE CODE:

The principal use code for this product(s) is "W" – Self-Luminous Light Source.

LEAK TEST FREQUENCY:

Please refer to the same information as previously submitted, accepted and approved by U.S.N.R.C. for TRUGLO License #42-23889-01E and Registration Certificate # NR-1180-D-101-E dated 2-15-06.

SEALED SOURCE INFORMATION:

Please refer to the same information as previously submitted, accepted and approved by U.S.N.R.C. for TRUGLO License #42-23889-01E and Registration Certificate # NR-1180-D-101-E dated 2-15-06.

GASEOUS TRITIUM LIGHT SOURCE (GTLS) HYDROGEN-3 (TRITIUM)

All sealed sources suggested for use in this device(s) are approved by the U.S.N.R.C.

SEALED SOURCES FOR THIS DEVICE:

MB-MICROTECH – MODEL 400/1
UP TO 30 mCi PER SEALED SOURCE
NRC REGISTRY NO: NR-446-S-102-S

MODEL INFORMATION:

The model numbers designated for these new products are revisions to the already existing and approved TG131/TG231 Series Gun Sights as listed in Registration Certificate # NR-1180-D-101-E amended on 2-15-06.

As already registered, the TRUGLO TG131/231 Series consists of front and rear sight combinations or front sights only. The newly submitted models for this series are related products to TG131/231 Series only. The newly submitted models fall within the current designs and tolerances of the TG131/231 Series Gun Sights.

The TG131/231 Series – Revision 2 consists of the previously NRC approved TRUGLO patented technology of combining a GTLS with fiber optic material to form an aiming device. The newly submitted device models for the TG131/231 Series – Revision 2 are as follows:

Model:

TG131MPT – (intended as a front and rear sight on a firearm)
TG231MP – (intended as a front and rear sight on a firearm)

Front sight proposed to contain one 30 mCi (maximum) GTLS unit.
Rear sight proposed to contain two 30 mCi (maximum) GTLS units.
Maximum of 30mCi per sealed source and maximum of 90mCi per weapon.

TRUGLO's intent is to continue to have these model numbers listed as a "series" due to the similarity of the design and construction of the submitted products. The detailed engineering drawings submitted with this application will help illustrate this statement. Please note that the GTLS is protected by at least .019" of material in all designs.

BYPRODUCT MATERIAL INFORMATION:

Please refer to the same information as previously submitted, accepted and approved by U.S.N.R.C. for TRUGLO License #42-23889-01E and Registration Certificate # NR-1180-D-101-E dated 11-12-02 and amended on 2-15-06 in its entirety.

STRUCTURAL MOUNTING OF GTLS:

TRUGLO TG131/231 Series - Revision 2 -- (Please refer to specified models contained in section MODEL INFORMATION of this application for amendment.)

Please note that the procedure for the structural mounting of the GTLS is the same procedure as previously submitted, accepted and approved by the U.S.N.R.C. for TRUGLO License #42-2388901E Amendment 01 and Registration Certificate #NR-1180-D-101-E amended and re-issued on 2-15-06. The protection of GTLS in the newly submitted models remains uncompromised in each device design respectively.

DEGREE OF ACCESS TO HUMAN BEINGS:

By design, each of the newly proposed devices prevents direct access to the GTLS at any time during normal handling and use by a human being. The GTLS is permanently affixed within the metal "bow and/or gun sight" housings respectively as previously submitted, accepted and approved by the U.S.N.R.C. for TRUGLO License #42-2388901E Amendment 01 and Registration Certificate #NR-1180-D-101-E amended and re-issued on 2-15-06. No compromise has been taken to increase the direct access to human beings.

TOTAL QUANTITY OF BYPRODUCT MATERIAL EXPECTED TO BE DISTRIBUTED ANNUALLY:

TG131/231 Series -- Revision 2

The anticipated sales of the newly proposed devices are expected to be approximately 5,000 -- 10,000 units in the first year. The 5-10,000 units include all newly proposed device models contained in this application for amendment. A total quantity of 40,000 units is inclusive of all existing and approved models of the TG131/231 Series plus the newly proposed models.

These newly proposed "gun sight" devices are not expected to increase sales beyond the 40,000 units from the already existing models in the marketplace during the first year. Reason being is that existing models in the marketplace to date have not yet exceeded the 40,000 units originally proposed. However, beginning in the second and third years as the new models are accepted into the marketplace, it is anticipated that sales will continue to grow to some extent and possibly exceed the 40,000 units.

Based on a maximum of 90 mCi per front and rear sight combination X 40,000 units, there could be approximately a maximum of 3,600 Curies per year of tritium distributed across the United States in the first year. Again, this amount of tritium remains approved by the U.S.N.R.C. for TRUGLO License #42-2388901E Amendment 01 and Registration Certificate #NR-1180-D-101-E amended and re-issued on 2-15-06. The maximum of 90 mCi per device is calculated by adding together the following:

1 Front Sight containing one 30mCi GTLS + 1 Rear Sight containing two 30mCi GTLS

Please note that front and rear sights are commonly used in combination with each other to complete the sighting device of a firearm. However, it is possible for the firearm to feature only one front sight containing a single GTLS (30mCi) in combination with a traditional non-illuminated rear sight; or feature only one rear sight containing 2 GTLS (60mCi) and a traditional non-illuminated front sight. Or furthermore, it is possible for firearm such as a shotgun to feature only a front sight containing a single GTLS (30 mCi) and no rear sight at all. In any of the referenced circumstances, the total amount of tritium per device would be lessened and need to be considered in the above equation illustrating the "maximum" set of circumstances at 90mCi per combination of front and rear sight to satisfy the U.S.N.R.C.'s evaluation.

ACTIVITY STORED IN ONE LOCATION:

As previously submitted, accepted and approved in Amendment 01, ideally large quantities of product are not held in stock due to economic considerations and inventory constraints. Product in general is produced on an "as needed" basis to fill orders as efficiently as possible without the burden of having excess inventory.

Again, based on a combination of considering already registered devices and other types of tritium illuminated aiming devices that TRUGLO is proposing in this application for amendment, although unlikely, it is estimated that the maximum activity to be stored at any one time contained in exempt devices would not exceed 900 Ci. For example purposes only, consider that this would allow for 8,000 front and rear gun sight combinations at a maximum of 90 mCi per set for a total of 720Ci, as well as 2,000 bow sights at a maximum of 30mCi each for a total of 60 Ci to accumulate in one location at a given point in time for a grand total of 780Ci.

CONDITIONS OF USE:

All information for this section remains exactly the same as previously approved by the U.S.N.R.C. for TRUGLO License #42-2388901E Amendment 01 and Registration Certificate #NR-1180-D-101-E amended and re-issued on 2-15-06 for both TG20 SERIES Bow Sights and TG131/231 SERIES gun sights.

Again, normal use of the newly proposed devices for TG131/231 Series – Revision 2 is by the recreational hunter or target shooter (general public) or possible law enforcement personnel. The likely environment remains to be the outdoors. Since the tritium illuminated

aiming devices remain attached for example to a firearm or bow, they are only in close proximity to the shooter on a limited basis.

No accident conditions can be thought of with the exception of the firearm or bow/crossbow being dropped to the ground from the hands of a person standing on the ground. Damage to the actual GTLS is estimated to be a very remote chance since the actual firearm/bow would take the impact of the fall to the ground. Firearms and bows/crossbows in general are designed to withstand compromising circumstances such as falls or drops to the ground although not recommended. Submitted prototype testing confirmed that the GTLS was not compromised in any way when subjected to possible accident conditions.

EXTREME CONDITIONS:

All information for this section remains exactly the same as previously approved by the U.S.N.R.C. for TRUGLO License #42-2388901E Amendment 01 and Registration Certificate #NR-1180-D-101-E amended and re-issued on 2-15-06 for TG131/231 Series gun sights.

Again, the proposed devices will not be subject to any extreme conditions as listed under Section 10.2 "Conditions of Use" of the NUREG-1556 Volume 3 since it will always be in the possession of the person handling the firearm or bow/crossbow. Firearms, bows/crossbows even in the absence of the proposed tritium aiming devices must be handled with care to avoid unwanted and unexpected adjustments to the equipment; especially the bow or gun sight itself that will directly affect the accuracy and performance of the firearm.

ESTIMATED WORKING LIFE OF THE DEVICE:

All information for this section remains exactly the same as previously approved by the U.S.N.R.C. for TRUGLO License #42-2388901E Amendment 01 and Registration Certificate #NR-1180-D-101-E amended and re-issued on 2-15-06 for TG131/231 Series gun sights.

Due to the radioactive nature of tritium and its radioactivity decay half-life of 12.3 years, the amount of tritium decreases with time. Tritium can also diffuse slowly through glass causing the brightness of the GTLS to dim over time. However, the estimated working life of the device is indefinite. Even if the tritium source expires and dims to the point that there is no visible illumination by the tritium, the fiber-optic material used in combination with the expired tritium source allows the aiming device to possess an indefinite life span. The fiber optic material can continue to be used as the aiming point for the firearm or bow/crossbow even in the absence of the illuminating properties of the tritium component. Even at this point, the aiming device is still completely functional and is considered competitive with existing aiming device technologies. Thus, both the already approved and newly proposed devices have an indefinite working life-span.

Again, TRUGLO anticipates the working life of the devices to be indefinite and the decay half-life of the tritium in 12.3 years. This statement is confirmed with the fact that even in the absence of the illuminating ability of the tritium, the fiber-optic material can continue to be used as the aiming point for the firearm or bow/crossbow.

MAXIMUM EXTERNAL RADIATION LEVELS AS REFERRED TO IN 10 CFR 32.22 (a)(2)(vi):

All information for this section remains exactly the same as previously approved by the U.S.N.R.C. for TRUGLO License #42-2388901E Amendment 01 and Registration Certificate #NR-1180-D-101-E amended and re-issued on 2-15-06 for TG131/231 Series gun sights.

CONSTRUCTION OF THE PRODUCT:

The contained documents illustrate the construction of the proposed gun sights:

TG131/231 Series – Revision 2

TG131MPT - Attachment A

TG231MP - Attachment B

Certain tolerances (such as dovetail dimensions) are considered as variations in shape or size and are contained in these drawings to be considered as part of the "Series". Such variations are referenced for your convenience on the drawings.

Again, please note that small modifications to the cosmetic or aesthetic appearance ONLY of various metal sight housings may be implemented by TRUGLO, Inc. at a point in time to better suit market demand and/or customer needs and satisfaction.

MATERIALS USED IN CONSTRUCTION OF THE PRODUCT:

Materials used in the construction of the products are stated on the submitted product drawings of the proposed aiming devices.

All materials used are the same as previously approved by the U.S.N.R.C. for TRUGLO License #42-2388901E Amendment 01 and Registration Certificate #NR-1180-D-101-E amended and re-issued on 2-15-06 for TG131/231 Series gun sights.

The materials are re-capped as follows for your convenience:

1. BOW OR GUN SIGHT BODY: Materials such as but not limited to: Steel or Aluminum.
2. BOW OR GUN SIGHT FIBER: (Applicable to TG131/TG20 TRITIUM FIBER OPTIC SERIES only.) Fluorescent plastic fiber.
3. TRITIUM VIAL ASSEMBLY: GTLS and structural mounting bracket.
4. GLUING AGENTS: Such as but not limited to: silicone based adhesives, clear optical glue (acrylic adhesives), elastomer adhesive such as but not limited to trade name "Black Max" by Loc-Tite and/or epoxy.

LABELING:

All information for this section remains exactly the same as previously approved by the U.S.N.R.C. for TRUGLO License #42-2388901E Amendment 01 and Registration Certificate #NR-1180-D-101-E amended and re-issued on 2-15-06 for TG131/231 Series gun sights.

As stated in the actual Registration #NR-1180-D-101-E, since it is not physically possible to mark or label the GTLS itself, "Each sight is permanently marked with "TG" and the symbol for tritium (H-3). The logo and H-3 are marked on the side of the bow sight pins and the gun sights. The preferred method of labeling still remains to be engraving or laser engraving. However, TRUGLO is not limited to considering other permanent methods of labeling in the future as technology becomes accessible or available. In addition, packaging of the device will contain information identifying the fact that the device contains tritium gas along with the proper instruction for the return of an unwanted device or defective product back to the manufacturer for disposal."

PROTOTYPE TESTING of PROPOSED GTLS SOURCES:

All information for this section remains exactly the same as previously approved by the U.S.N.R.C. for TRUGLO License #42-2388901E Amendment 01 and Registration Certificate #NR-1180-D-101-E amended and re-issued on 2-15-06 for TG131/231 Series gun sights.

PROTOTYPE TESTING OF PROPOSED DEVICE:

TRUGLO previously performed the following prototype tests for all sights: chemical, temperature, humidity, temperature shock, vibration, pressure, penetration, and mechanical shock.

All prototype testing was conducted in accordance with NUREG-1556, Vol. 8, Appendix "O" as required. Prototype testing was performed to show the product's integrity in protecting the GTLS from damage or destruction. Please note that there is no external radiation hazard from tritium. No structural degradation of the "bow or gun sight" or structural mounting bracket containing the GTLS is anticipated.

As previously identified, tritium decays with a characteristic half-life of 12.3 years. Tritium is known to slowly diffuse through glass and can oxidize to tritium oxide in the atmosphere.

Each sample was visually inspected between each test and after completion of all the tests to ensure that no detrimental effects occurred. The prototype testing exhibited NO tritium leakage or breakage of the sight or source.

Due to the structure of the proposed new model sights being exactly the same as the already approved TG131/231 Series with the exception of dovetail dimensions, no new prototype testing was performed for the proposed models. Again, the protection of GTLS in the newly submitted models remains uncompromised in each device design respectively.

**ESTIMATED EXTERNAL RADIATION DOSES & RADIATION DOSES
RELEVANT TO 10 CFR32.23 & 32.24:**

All information for this section remains exactly the same as previously approved by the U.S.N.R.C. for TRUGLO License #42-2388901E Amendment 01 and Registration Certificate #NR-1180-D-101-E amended and re-issued on 2-15-06 for TG131/231 Series gun sights.

QUALITY ASSURANCE AND CONTROL:

All information for this section remains exactly the same as previously approved by the U.S.N.R.C. for TRUGLO License #42-2388901E Amendment 01 and Registration Certificate #NR-1180-D-101-E amended and re-issued on 2-15-06 for TG131/231 Series gun sights.

As stated in Registration #NR-1180-D-101-E, "TRUGLO, Inc. has submitted a quality assurance and control (QA/QC) program that has been found to be acceptable by the NRC for the production and distribution of the TG-20, TG131 and TG231 Series sights by TRUGLO. A copy of this program is on file with the NRC."

ATTACHMENT "A"

**TG131 SERIES
REVISION 2**

TG131MPT

Page 076 of 131

Withheld pursuant to exemption

(b)(4)

of the Freedom of Information and Privacy Act

Page 077 of 131

Withheld pursuant to exemption

(b)(4)

of the Freedom of Information and Privacy Act

ATTACHMENT "B"

**TG231 SERIES
REVISION 2**

TG231MPT

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Withheld pursuant to exemption

(b)(4)

of the Freedom of Information and Privacy Act

Page 080 of 131

Withheld pursuant to exemption

(b)(4)

of the Freedom of Information and Privacy Act

ATTACHMENT "C"

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES SAFETY EVALUATION OF DEVICE (AMENDED IN ITS ENTIRETY)

NO.: NR-1180-D-101-E DATE: February 15, 2006 PAGE 1 OF 5

DEVICE TYPE: Bow and Gun Sights

MODEL: TG-20 and TG-20X Series (bow sights)
 TG-131 and TG-231 Series (gun sights)

MANUFACTURER/DISTRIBUTOR: TRUGLO, Inc.
 710 Presidential Drive
 Richardson, TX 75081
 (formerly 13745 Neutron Road
 Dallas, TX 75244)

SEALED SOURCE MODEL DESIGNATION: SRB Technologies, Model M-1
 Mb-Microtec, Model 400/1

<u>ISOTOPE:</u>	<u>MAXIMUM ACTIVITY:</u>
Hydrogen-3	30 mCi (1110 MBq) per bow sight
	90 mCi (3330 MBq) per gun sight device (3x30 mCi)

LEAK TEST FREQUENCY: Not Required

PRINCIPAL USE: (W) Self-Luminous Light Source

CUSTOM SOURCE: _____ YES X NO

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE
(AMENDED IN ITS ENTIRETY)

NO.: NR-1180-D-101-E DATE: February 15, 2006 PAGE 2 OF 5

DEVICE TYPE: Bow and Gun Sights

DESCRIPTION:

The TG-20 and TG-20X Series bow sights are primarily used by recreational hunters or target shooters to improve low-light shooting capability. The sight pins are mounted on archery sights and affixed to the bow. Likewise, the TG-131 and TG-231 Series gun sights are primarily used by recreational hunters or law enforcement personnel to improve low-light shooting capability. The front and rear gun sights are secured in a structural mounting and affixed to a gun.

The byproduct material is tritium (H-3) in gaseous form, sealed into borosilicate glass tubes. The sources used are Mb Microtec Model 400/1 (NRC registration certificate NR-446-S-102-S) or SRB Technology, Inc. Model M-1 registration certificate NC-585-S-102-S. The manufacturer states that the working life of a sight is indefinite, the decay half-life of tritium is 12.3 years. Each archery pin or front gun sight contains one source with a maximum activity of 30 mCi (1110 MBq). A rear gun sight combined activity of 60 mCi (2220 MBq). An individual gun may use one front and one rear sight, for a maximum combined activity of 90 mCi (3330 MBq).

In bow sights, the gaseous tritium light source (GTLS) units are placed in a structural mounting bracket of plastic tubing which is inserted into a steel casing. A gluing agent is used to permanently affix the plastic tubing in the steel casing. The sources are inaccessible to the user. The sight is mounted to the bow by means of a screw/clamp connection. The overall dimensions for the TG-20 Series are 1.2 inches in length and 0.2 inches in width. The TG-20X Series dimensions are 2 inches in length and 0.25 inches in width.

The TG-20 Series bow sights consist of three models. The difference between the three models is the shape of the base. The base may be square, rectangular, or round.

In gun sights, the GTLS units are placed in a structural mounting bracket of plastic tubing. A silicone gluing agent, acetoxysilicone rubber or equivalent, is used to permanently affix the GTLS in the plastic tubing. An acrylated urethane adhesive

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE
(AMENDED IN ITS ENTIRETY)

NO.: NR-1180-D-101-E DATE: February 15, 2006 PAGE 3 OF 5

DEVICE TYPE: Bow and Gun Sights

DESCRIPTION (Cont'd):

creates a lens at the end of the GTLS assembly. The plastic tubing and GTLS assembly is inserted into a metal gun sight housing. The housing is machined from 12L14 steel, or metal of equivalent physical and chemical properties, with a minimum wall thickness of 0.019 inches (0.048 cm). A silicone gluing agent affixes the GTLS to the metal housing. Finally, the GTLS is sealed in the metal housing with an elastomeric adhesive to make the sources inaccessible to the user. The maximum dimensions of a front gun sight are 1.3 inches (3.3 cm) length, 0.37 inches (0.94 cm) width and 0.78 inches (2.0 cm) height. The maximum dimensions of a rear gun sight are 1.3 inches (3.3 cm) length, 1.2 inches (3.0 cm) width and 0.88 inches (2.2 cm) height.

In the TG-131 and TG-231 Series gun sights both series have Models A1, A2 and A3 are front gun sights, containing one radioactive source, while B1 and B2 are rear gun sights containing two radioactive sources. Differing models have screw/clamp, stake or dovetail mounting connection. The TG-131 Series contains a fiber optic cable and the TG-231 Series does not. Additionally, TG-131 Series contains Models TG-131AR, TG-131SG, and TG-131ML, with variations in physical configurations, mounting and routing of the fiber optic cable.

LABELING:

Each sight is permanently marked with the TRUGLO logo "TG" and the symbol for tritium (H-3). The logo and H-3 are marked on the side of the bow sight plans and gun sights. In addition, packaging of the device will contain information identifying the fact that the device contain tritium gas along with the proper instruction for the return of an unwanted device or defective product back to the manufacturer for disposal.

DIAGRAMS:

See Attachments 1 through 11.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE
(AMENDED IN ITS ENTIRETY)

NO.: NR-1180-D-101-E DATE: February 15, 2006 PAGE 4 OF 5

DEVICE TYPE: Bow and Gun Sights

PROTOTYPE TESTING:

Truglo performed the following prototype tests for all sights: temperature, humidity, temperature shock, pressure, penetration, and mechanical shock. In addition, vibration and firing tests were performed to establish the integrity of the gun sights.

The same sight pins were used for each test of the TG-20 Series. Five sets of sights from each of the two gun sight series, TG-131 and TG-231, were tested. A test set included two sights: one front sight (Model A1) and one rear sight (Model B1). Each of the gun sights tested used a stake mounting connection. Each sight was visually inspected between each test and after completion of all the tests to ensure that no detrimental effects occurred. The prototype testing exhibited no tritium leakage or breakage of the sight or source.

QUALITY ASSURANCE AND CONTROL:

TRUGLO, Inc. has submitted a quality assurance and control (QA/QC) program that has been found to be acceptable by NRC for production and distribution of sights by TRUGLO. A copy of this program is on file with the NRC.

SAFETY ANALYSIS SUMMARY:

Based on our review of the information provided and test data cited above, we conclude that TRUGLO, Inc.'s sight models meet the safety criteria set forth in 10 CFR 32.23. Furthermore, we conclude that the sealed tritium light sources would maintain containment integrity under normal conditions and accidental conditions of use. Therefore, we conclude that the bow sights and gun sights are acceptable for exempt licensing purposes.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE
(AMENDED IN ITS ENTIRETY)

NO.: NR-1180-D-101-E DATE: February 15, 2006 PAGE 5 OF 5

DEVICE TYPE: Bow and Gun Sights

REFERENCES:

The following supporting documents for TRUGLO, Inc. bow and gun sights are hereby incorporated by reference and are made a part of the registry document.

- TRUGLO, Inc. device registration and exempt materials license applications dated June 12, 2002, with enclosures thereto.
- TRUGLO, Inc. letters dated August 29, 2002 and September 26, 2002.
- TRUGLO, Inc. device registration and exempt materials license amendment applications dated May 20, 2003, with enclosures thereto.
- TRUGLO, Inc. letters dated September 11, 2003, and October 14, 2003, with enclosures thereto.
- TRUGLO, Inc. electronics mails dated October 11, 2003, October 15, 2003, October 20, 2003, and October 28, 2003, with enclosures thereto.
- TRUGLO, Inc. letter dated January 25, 2005 and June 17, 2005.
- TRUGLO, Inc. application dated November 30, 2005, and electronic mail dated January 23, 2006, with enclosures thereto.

ISSUING AGENCY:

U.S. Nuclear Regulatory Commission

Date: February 15, 2006

Reviewer: Nima Ashkeboussi
Nima Ashkeboussi

Date: February 15, 2006

Concurrence: John P. Jankovich
John P. Jankovich

11 pages withheld in their entirety –
exemption (b)(4)

ATTACHMENT "D"

NRC FORM 374

PAGE 1 OF 2 PAGES

U.S. NUCLEAR REGULATORY COMMISSION

Amendment No. 04

MATERIALS LICENSE

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 36, 39, 40, and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations, and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

Licensee	In accordance with letter dated November 30, 2005
1. TRUGLO, Inc.	3. License number 42-23889-01E is amended in its entirety to read as follows:
2. 710 Presidential Drive Richardson, TX 75081	4. Expiration date November 30, 2012
	5. Docket No. 030-36055 Reference No.

6. Byproduct, source, and/or special
nuclear material

7. Chemical and/or physical form

8. Maximum amount that licensee may
possess at any one time under this
license

A. Hydrogen - 3

A. Sealed self-luminous light
sources (SRB
Technologies Model M-1,
and Mb-Microtec Model
400/1)A. Not applicable
(See Condition 11)

9. Authorized use:

Pursuant to Section 32.22, 10 CFR Part 32, "Specific Domestic Licenses to Manufacture or Transfer Certain Items Containing Byproduct Material"; the licensee is authorized to distribute sealed self-luminous light sources in archery pins and gun sights as specified in Condition 10 of this license to persons exempt from the requirements for a license pursuant to Section 30.19, 10 CFR Part 30, or equivalent provisions of the regulations of any Agreement State.

CONDITIONS

10. The licensee is authorized to distribute the following series of self-luminous archery pin and gun sight devices:

<u>Device Model</u>	<u>Maximum Activity</u>
TG-20 Series (Bow Sights)	30 millicuries (1110 MBq) per bow sight
TG-20X Series (Bow Sights)	30 millicuries (1110 MBq) per bow sight
TG-131 Series (Gun Sights)	90 millicuries (3330 MBq) per gun sight device
TG-231 Series (Gun Sights)	90 millicuries (3330 MBq) per gun sight device

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**License Number
42-23889-01EDocket or Reference Number
030-36055

Amendment No. 04

CONDITIONS

(Continued)

11. This license does not authorize possession or use of licensed material.
12. Licensed material shall be distributed only from the licensee's facility located at 710 Presidential Drive, Richardson, TX 75081.
13. The licensee shall file periodic reports as specified in 10 CFR 32.25(c).
14. Except as specifically provided otherwise by this license, the licensee shall conduct its program in accordance with the statements, representations, and procedures contained in the documents, including any enclosures, listed below. The U.S. Nuclear Regulatory Commission's regulations shall govern unless the statements, representations, and procedures in the licensee's application and correspondence are more restrictive than the regulations.
 - A. Application dated June 12, 2002;
 - B. Letter dated August 29, 2002;
 - C. Letter dated September 26, 2002;
 - D. Letter dated May 20, 2003;
 - E. Letter dated September 11, 2003;
 - F. Letter dated October 14, 2003;
 - G. Letter dated January 25, 2005;
 - H. Letter dated June 17, 2005;
 - I. Letter dated November 30, 2005; and
 - J. Registration Certificate No. NR-1180-D-101-E.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Date: February 15, 2006

[Signature]
Richard K. Struckmeyer
Materials Safety and Inspection Branch
Division of Industrial and
Medical Nuclear Safety
Office of Nuclear Material Safety
and Safeguards
Washington, DC 20555



ATTACHMENT "E"

Department of State Health Services

RADIOACTIVE MATERIAL LICENSE

Pursuant to the Texas Radiation Control Act and Texas Department of State Health Services (Agency) regulations on radiation, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess and transfer radioactive material listed below; and to use such radioactive material for the purpose(s) and at the place(s) designated below. This license is subject to all applicable rules, regulations and orders of the Agency now or hereafter in effect and to any conditions specified below.

LICENSEE

1. Name **TRUGLO INC**
ATTN LORRAINE L HELLINGHAUSEN
2. Address **710 PRESIDENTIAL DRIVE**
RICHARDSON TX 75081

This license is issued in response to a letter

Dated: **April 20, 2009**

Signed by: **Lorraine Hellinghausen**

3. License Number

L05519

Amendment Number

06

PREVIOUS AMENDMENTS ARE VOID

4. Expiration Date

March 31, 2012

RADIOACTIVE MATERIAL AUTHORIZED

5. Radioisotope A. H-3	6. Form of Material A. Sealed source (MB-Microtec Models 400/1, 400/2 and 400/3)	7. Maximum Activity* A. No single source to exceed 30 mCi Total: 900 Ci	8. Authorized Use A. Manufacture and storage of archery pins containing self-luminous light sources pending distribution pursuant to U.S. Nuclear Regulatory Commission License No. 42-23889-01E.
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* Ci-Curies mCi-Millicuries μ Ci-Microcuries

9. Radioactive material shall only be stored and used at:

Site Number
001

Location
Richardson - 710 Presidential Drive

10. Each site shall maintain documents and records pertinent to the operations at that site. Copies of all documents and records required by this license shall be maintained for Agency review at Site 001.

11. The licensee shall comply with the provisions (as amended) of Title 25 Texas Administrative Code (TAC) §289.201, §289.202, §289.203, §289.204, §289.205, §289.251 and §289.252.

12. The individual designated to perform the functions of Radiation Safety Officer (RSO) for activities covered by this license is Lorraine L. Hellinghausen.

13. Radioactive material shall be used by, or under the direct supervision of, individuals designated by the RSO only after each worker has successfully completed a training course determined by the Agency as appropriate. Documentation verifying the successful completion of the training for each worker shall be maintained by the licensee for inspection by the Agency.

14. Sealed sources containing radioactive material shall not be opened.

15. The licensee shall conduct a physical inventory, at least every six months, to account for all sealed sources received and possessed under the license. The records of the inventories shall be maintained for inspection by the Agency for three years from the date of the inventory and shall include the radionuclide, number of curies, location of each source of radiation, the name of the individual making the inventory, and the date of the inventory.



Department of State Health Services

RADIOACTIVE MATERIAL LICENSE

LICENSE NUMBER	AMENDMENT NUMBER
L05519	06

16. The licensee shall conduct radiation contamination surveys of all radioactive material use and storage areas at intervals not to exceed 30 days or when it is suspected that a tritium light source has become compromised. Surveys shall be taken in the form of surface wipes using appropriate media for subsequent gas proportional counting or liquid scintillation counting. If analysis reveals the presence of radioactive contamination in excess of the limits contained in 25 TAC §289.202(ggg)(6), the licensee shall immediately enable contamination control actions and notify the agency of the analysis findings.
17. Except as specifically provided otherwise by this license, the licensee shall possess and use the radioactive material authorized by this license in accordance with statements, representations, and procedures contained in the following:

application dated January 21, 2002,
letters dated March 18, 2002, March 21, 2003, and January 25, 2005.

Title 25 TAC §289 (as amended) shall prevail over statements contained in the above documents unless such statements are more restrictive than the regulations.

DBF

FOR THE DEPARTMENT OF STATE HEALTH SERVICES

Date: June 23, 2009

David B. Fogle, Chief
Advanced-Technology Licensing Program



U.S. NUCLEAR
REGULATORY
COMMISSION REQUEST
FOR AMMENDMENT

PRESENTED TO:

MR. JOHN P. JANKOVICH

September 20, 2011

Mr. John P. Jankovich
United States Nuclear Regulatory Commission
Materials Safety and Inspection Branch
Division of Industrial and Medical Nuclear Safety
Office of Nuclear Material Safety and Safeguards
Washington, D.C. 20555-0001

Dear Mr. Jankovich:

Please accept the enclosed documents as a request for an amendment to TRUGLO's existing U.S.N.R.C. License #42-23889-01E and Registration Certificate # NR-1180-D-101-E / Docket or Reference #030-36055. Please note that the purpose of this request for amendment is simply to broaden the scope of models offered by TRUGLO to the already existing "aiming sights" approved and included on TRUGLO's existing license by adding a new series – TG13 Series. The request for this amendment has no affect on the original safety evaluation of the device(s). The intended purpose is to again broaden the scope of approved models to allow TRUGLO to fulfill market demands and needs.

We once again have followed the original format of the Sealed Source & Device Evaluation & Registration for Certificate # NR-1180-D-101-E in an attempt to present information for the additional "aiming sights" in a concise and efficient manner for your convenience.

In the event that information within a section of these documents remains exactly the same as previously submitted, accepted and approved by the U.S.N.R.C. for TRUGLO's existing license and registration certificate respectively, then the following phrase appears under the particular section in blue ink: "Please refer to the same information as previously submitted, accepted and approved by U.S.N.R.C. for TRUGLO License #42-23889-01E and Registration Certificate # NR-1180-D-101E."

In the event that only part of the information contained within the section of these documents has changed, the "new" or "revised" text appears in "blue" print to distinguish it from the original text submitted by TRUGLO in accordance with the issuance of our current respective license and registration certificate.

Any section containing only "new" information has all information appearing in "blue" print as well to help distinguish that the information being provided is "new" and pertains to the requested amendment.

No fee has been enclosed with these documents as it remains our understanding that no fee currently applies to this request. Please feel free to contact me with any questions or comments. I can be reached by telephone at 972-774-0300 or e-mail at lhellinghausen@truglo.com.

Thank you in advance for your time and consideration.

Sincerely,
TRUGLO, INC.

Lorraine L. Hellinghausen
Radiation Safety Officer

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DEPARTMENT OF HEALTH

APPLICATION FOR AMENDMENT TO
U.S.N.R.C. LICENSE #42-23889-01E
FOR THE APPROVED SEALED SOURCE & DEVICE EVALUATION
& REGISTRATION CERTIFICATE #NR-1180-D-101-E

NAME & ADDRESS OF APPLICANT:

TRUGLO, INC.
710 PRESIDENTIAL DRIVE
RICHARDSON, TX 75081

INDIVIDUAL TO BE CONTACTED FOR ADDITIONAL INFORMATION:

LORRAINE HELLINGHAUSEN
RADIATION SAFETY OFFICER
972-774-0300
972-774-0323 FAX
lhellinghausen@truglo.com

TRUGLO, INC. is applying to be both the manufacture and distributor of the specified product(s).

PRODUCT NAME USED BY THE INDUSTRY:

The product(s) proposed for the amendment is commonly known in the industry as an "aiming sight" or "gun sight". A "gun sight" is considered part of the same category as "aiming sights" which are products distributed to persons exempt from licensing under 10 CFR 30.19.

PRODUCT(S) IS FOR USE BY:

The product(s) proposed for the amendment is intended for use by the recreational sportsman or law enforcement personnel to improve low-light shooting capabilities. It will be sold to the general public.

PRINCIPAL USE CODE:

The principal use code for this product(s) is "W" – Self-Luminous Light Source.

LEAK TEST FREQUENCY:

Please refer to the same information as previously submitted, accepted and approved by U.S.N.R.C. for TRUGLO License #42-23889-01E and Registration Certificate # NR-1180-D-101-E dated 5-17-10.

SEALED SOURCE INFORMATION:

Please refer to the same information as previously submitted, accepted and approved by U.S.N.R.C. for TRUGLO License #42-23889-01E and Registration Certificate # NR-1180-D-101-E dated 5-17-10.

GASEOUS TRITIUM LIGHT SOURCE (GTLS) HYDROGEN-3 (TRITIUM)

All sealed sources suggested for use in this device(s) are approved by the U.S.N.R.C.

SEALED SOURCES FOR THIS DEVICE:

MB-MICROTECH – MODEL 400/1

UP TO 30 mCi PER SEALED SOURCE

NRC REGISTRY NO: NY-1271-S-101-S

(Supersedes: NR-446-S-102-S)

MODEL INFORMATION:

The model numbers designated for these new products begin a new series – TG13 Series. This series consists of the implementation of enhancements made to TG131/231 Series sights previously approved by the U.S.N.R.C. as listed in Registration Certificate # NR-1180-D-101-E for TRUGLO's patented technology combining a GTLS with fiber optic material to form an aiming device/gun sight.

As already registered, the TRUGLO TG131/231 Series consists of front and rear sight combinations or front sights only. The newly submitted models for TG13 Series are related to TG131/231 Series sights in the same manner. TG13 Series consists of front and rear sights combinations or front sights only. The newly submitted TG13 Series models also are similar in design to the previously NRC approved TG131/231 Series Gun Sights.

The newly submitted device models for the TG13 Series are as follows:

TG13 Series – Front Sight Models

A1	Intended as a front sight on a firearm.
A2	Intended as a front sight on a firearm.
A3	Intended as a front sight on a firearm.
A4	Intended as a front sight on a firearm.
A5	Intended as a front sight on a firearm.
A6	Intended as a front sight on a firearm.
A7	Intended as a front sight on a firearm.

TG13 Series – Rear Sight Models

B1	Intended as a rear sight on a firearm.
B2	Intended as a rear sight on a firearm.

Front sight proposed to contain one 30 mCi (maximum) GTLS unit.
Rear sight proposed to contain two 30 mCi (maximum) GTLS units.
Maximum of 30mCi per sealed source and maximum of 90mCi per firearm.

TRUGLO's intent is to continue to have these model numbers listed as a "series" due to the similarity of the design and construction of the submitted products. The detailed engineering drawings submitted with this application will help illustrate this statement. Please note that for TG13 Series, the GTLS is protected by at least .019" of material in all designs as previously submitted, accepted and approved by the U.S.N.R.C. for TRUGLO License #42-23889-01E and Registration Certificate #NR-1180-D-101-E dated 5-17-10.

BYPRODUCT MATERIAL INFORMATION:

Please refer to the same information as previously submitted, accepted and approved by U.S.N.R.C. for TRUGLO License #42-23889-01E and Registration Certificate # NR-1180-D-101-E dated 5-17-10.

STRUCTURAL MOUNTING OF GTLS:

TRUGLO TG13 Series (Please refer to specified models contained in section MODEL INFORMATION of this application for amendment.)

Please note that the procedure for the basic structural mounting of the GTLS is fundamentally the same procedure as previously submitted, accepted and approved by the U.S.N.R.C. for TRUGLO License #42-23889-01E and Registration Certificate #NR-1180-D-101-E dated 5-17-10. However, the "lens" created using clear optical glue is unnecessary to the design elements of TG13 Series and has therefore been removed. Please note the removal of the "lens" from this assembly is for design reasons only. The protection of GTLS in the newly submitted TG13 Series remains uncompromised in each device design respectively.

The information below outlines the enhancements made for TG13 Series to the structural mounting of the GTLS:

Attachment "A": TRITIUM VIAL ASSEMBLY

This procedure remains unchanged from previously submitted, accepted and approved U.S.N.R.C. TRUGLO License #42-23889-01E and Registration Certificate #NR-1180-D-101-E dated 5-17-10 except as noted above regarding the omission of the clear optical glue for formation of a "lens" for design purposes only. The protection of GTLS is not affected by this omission.

Attachment "B": TRITIUM & FIBER CAPSULE ASSEMBLY

This procedure demonstrates the implemented enhancement to the previously submitted, accepted and approved U.S.N.R.C. TRUGLO License #42-23889-01E and Registration Certificate #NR-1180-D-101-E dated 5-17-10.

The already protected GTLS from Attachment "A" – TRITIUM VIAL ASSEMBLY is inserted into a protective plastic capsule/encasement. The protective plastic capsule/encasement is thermally sealed to form a comprehensive protective outer shell for the GTLS and fiber assembly.

The thermally sealed encasement of the combination of the protected GTLS/Fiber-Optic assembly actually provides an additional layer of protection from damage and/or access to the GTLS at all times.

Attachment "C": GUN SIGHT ASSEMBLY

This procedure demonstrates the insertion of the thermally sealed capsule/encasement into the all metal "gun-sight" housing. The all metal "gun sight" housing itself provides additional support and protection for the GTLS and prevents direct access to the GTLS at the same time.

DEGREE OF ACCESS TO HUMAN BEINGS:

By design, each of the newly proposed devices prevents direct access to the GTLS at any time during normal handling and use by a human being. The GTLS is permanently affixed within the metal "bow and/or gun sight" housings respectively as previously submitted, accepted and approved by the U.S.N.R.C. for TRUGLO License #42-23889-01E and Registration Certificate #NR-1180-D-101-E dated 5-17-10. No compromise has occurred to increase direct access to human beings.

TOTAL QUANTITY OF BYPRODUCT MATERIAL EXPECTED TO BE DISTRIBUTED ANNUALLY:

TG13 Series

The anticipated sales of the newly proposed TG13 Series devices are expected to be approximately 10,000 units in the first year. The 10,000 units include all newly proposed device models contained in this application for amendment. An estimated total quantity of 45,000 units is inclusive of all existing and approved models of the TG131/231 Series plus the newly proposed TG13 Series models.

These newly proposed "gun sight" devices are not expected to increase sales beyond the 45,000 units from the already existing models in the marketplace during the first year. In the second and third years as the new models are accepted into the marketplace, it is anticipated that sales will continue to grow to some extent and possibly exceed the 45,000 units. However, market displacement of TG131/231 Series sights is expected to occur in the second and third years as the consumer migrates in time to the newer TG13 Series sights.

Based on a maximum of 90 mCi per front and rear sight combination X 45,000 units, there could be approximately a maximum of 4,050 Curies per year of tritium distributed across the United States in one year. Again, the amount of tritium per unit remains approved by the U.S.N.R.C. for TRUGLO License #42-23889-01E and Registration Certificate #NR-1180-D-101-E dated 5-17-10. The maximum of 90 mCi per device is calculated by adding together the following:

1 Front Sight containing one 30mCi GTLS + 1 Rear Sight containing two 30mCi GTLS

Please note that front and rear sights are commonly used in combination with each other to complete the sighting device of a firearm. However, it is possible for the firearm to feature only one front sight containing a single GTLS (30mCi) in combination with a traditional non-illuminated rear sight; or feature only one rear sight containing 2 GTLS (60mCi) and a traditional non-illuminated front sight. Or furthermore, it is possible for a firearm such as a shotgun to feature only a front sight containing a single GTLS (30 mCi) and no rear sight at all. In any of the referenced circumstances, the total amount of tritium per device would be lessened and need to be considered in the above equation illustrating the "maximum" set of circumstances at 90mCi per combination of front and rear sight to satisfy the U.S.N.R.C.'s evaluation.

ACTIVITY STORED IN ONE LOCATION:

As previously submitted, accepted and approved in U.S.N.R.C. TRUGLO License #42-23889-01E and Registration Certificate #NR-1180-D-101-E, ideally large quantities of product are not held in stock due to economic considerations and inventory constraints. Product in general is produced on an "as needed" basis to fill orders as efficiently as possible without the burden of having excess inventory.

Again, based on a combination of considering already registered devices and the new TG13 Series tritium illuminated aiming devices that TRUGLO is proposing in this application for amendment, although unlikely, it is estimated that the maximum activity to be stored at any one time contained in exempt devices would not exceed 900 Ci. For example purposes only, consider that this would allow for 9,500 front and rear gun sight combinations at a maximum of 90 mCi per set for a total of 855 Ci, as well as 500 bow sights at a maximum of 30mCi each for a total of 15 Ci to accumulate in one location at a given point in time for a grand total of 870 Ci.

CONDITIONS OF USE:

All information for this section remains exactly the same as previously approved by the U.S.N.R.C. for TRUGLO License #42-23889-01E and Registration Certificate #NR-1180-D-101-E dated 5-17-10 for TG131/231 SERIES gun sights.

Again, normal use of the newly proposed devices for TG13 Series is by the recreational hunter or target shooter (general public) or possible law enforcement personnel. The likely environment remains to be the outdoors. Since the tritium illuminated aiming devices remain attached to a firearm for example, they are only in close proximity to the shooter on a limited basis.

No accident conditions can be thought of with the exception of the firearm being dropped to the ground from the hands of a person standing on the ground. Damage to the actual GTLS is estimated to be a very remote chance since the actual firearm would take the impact of the fall to the ground. Firearms in general are designed to withstand compromising circumstances such as falls or drops to the ground although not recommended. Submitted prototype testing confirmed that the GTLS was not compromised when subjected to possible accident conditions.

EXTREME CONDITIONS:

All information for this section remains exactly the same as previously approved by the U.S.N.R.C. for TRUGLO License #42-23889-01E and Registration Certificate #NR-1180-D-101-E dated 5-17-10 for TG131/231 Series gun sights.

Again, the proposed devices will not be subject to any extreme conditions as listed under Section 10.2 "Conditions of Use" of the NUREG-1556 Volume 3 since it will always be in the possession of the person handling the firearm. Firearms, even in the absence of the proposed tritium aiming devices, must be handled with care to avoid unwanted and unexpected adjustments to the equipment; especially the gun sight itself that will directly affect the accuracy and performance of the firearm.

ESTIMATED WORKING LIFE OF THE DEVICE:

All information for this section remains exactly the same as previously approved by the U.S.N.R.C. for TRUGLO License #42-23889-01E and Registration Certificate #NR-1180-D-101-E dated 5-17-10 for TG131/231 Series gun sights.

Due to the radioactive nature of tritium and its radioactivity decay half-life of 12.3 years, the amount of tritium decreases with time. Tritium can also diffuse slowly through glass causing the brightness of the GTLS to dim over time. However, the estimated working life of the device is indefinite. Even if the tritium source expires and dims to the point that there is no visible illumination by the tritium, the fiber-optic material used in combination with the expired tritium source allows the aiming device to possess an indefinite life span. The fiber optic material can continue to be used as the aiming point for the firearm even in the absence of the illuminating properties of the tritium component. Even at this point, the aiming device is still completely functional and is considered competitive with existing aiming device technologies. Thus, both the already approved and newly proposed devices have an indefinite working life-span.

Again, TRUGLO anticipates the working life of the devices to be indefinite and the decay half-life of the tritium in 12.3 years. This statement is confirmed with the fact that even in the absence of the

illuminating ability of the tritium, the fiber-optic material can continue to be used as the aiming point for the firearm.

MAXIMUM EXTERNAL RADIATION LEVELS AS REFERRED TO IN 10 CFR 32.22 (a)(2)(vi):

All information for this section remains exactly the same as previously approved by the U.S.N.R.C. for TRUGLO License #42-23889-01E and Registration Certificate #NR-1180-D-101-E dated 5-17-10 for TG131/231 Series gun sights.

CONSTRUCTION OF THE PRODUCT:

The contained documents illustrate the construction of the proposed gun sights:

TG13 Series

TG13 Series – A1-A7 (Front Sight) - Please refer to **Attachment "D"**.

TG13 Series – B1-B2 (Rear Sight) - Please refer to **Attachment "E"**.

Certain tolerances (such as dovetail dimensions) are considered as variations in shape or size and are contained in these drawings to be considered as part of the "Series". Such variations are referenced for your convenience on the drawings.

Again, please note that small modifications to the cosmetic or aesthetic appearance ONLY of various metal sight housings may be implemented by TRUGLO, Inc. at a point in time to better suit market demand and/or customer needs and satisfaction.

MATERIALS USED IN CONSTRUCTION OF THE PRODUCT:

Materials used in the construction of the products are stated on the submitted product drawings of the proposed aiming devices.

All materials used are the same as previously approved by the U.S.N.R.C. for TRUGLO License #42-23889-01E and Registration Certificate #NR-1180-D-101-E dated 5-17-10 for TG131/231 Series gun sights.

The materials are re-capped as follows for your convenience:

1. Bow or Gun Sight Body: Materials such as but not limited to: Steel or Aluminum.
2. Bow or Gun Sight Fiber: (Applicable to TG131/TG20 TRITIUM FIBER OPTIC SERIES only.) Fluorescent plastic fiber.
3. Tritium Vial Assembly: GTLS and structural mounting bracket.
4. Gluing Agents: Material such as but not limited to silicone based adhesives, clear optical glue (acrylic adhesives), elastomer adhesive such as but not limited to trade name "Black Max" by Loc-Tite and/or epoxy.

Additional new materials include:

1. Protective Capsule/Encasement: Materials such as but not limited to various plastics.

LABELING:

All information for this section remains exactly the same as previously approved by the U.S.N.R.C. for TRUGLO License #42-23889-01E and Registration Certificate #NR-1180-D-101-E dated 5-17-10 for TG131/231 Series gun sights.

As stated in the actual Registration #NR-1180-D-101-E, since it is not physically possible to mark or label the GTLS itself, "Each sight is permanently marked with "TG" and the symbol for tritium (H-3). The logo and H-3 are marked on the side or top of the bow sight pins and the gun sights. The preferred method of labeling still remains to be engraving or laser engraving. However, TRUGLO is not limited to considering other permanent methods of labeling in the future as technology becomes accessible or available. In addition, packaging of the device will contain information identifying the fact that the device contains tritium gas along with the proper instruction for the return of an unwanted device or defective product back to the manufacturer for disposal.

PROTOTYPE TESTING OF PROPOSED GTLS SOURCES:

All information for this section remains exactly the same as previously approved by the U.S.N.R.C. for TRUGLO License #42-23889-01E and Registration Certificate #NR-1180-D-101-E dated 5-17-10 for TG131/231 Series gun sights.

PROTOTYPE TESTING OF PROPOSED DEVICE:

TRUGLO previously performed the following prototype tests for all sights: chemical, temperature, humidity, temperature shock, vibration, pressure, penetration, and mechanical shock.

All prototype testing was conducted in accordance with NUREG-1556, Vol. 8, Appendix "O" as required. Prototype testing was performed to show the product's integrity in protecting the GTLS from damage or destruction. Please note that there is no external radiation hazard from tritium. No structural degradation of the "gun sight" or structural mounting bracket containing the GTLS is anticipated.

As previously identified, tritium decays with a characteristic half-life of 12.3 years. Tritium is known to slowly diffuse through glass and can oxidize to tritium oxide in the atmosphere.

Each sample was visually inspected between each test and after completion of all the tests to ensure that no detrimental effects occurred. The prototype testing exhibited NO tritium leakage or breakage of the sight or source.

Again, the protection of GTLS in the newly submitted TG13 Series models remains uncompromised in each device design respectively.

Please refer to **Attachment "F"** for Prototype Test Results.

ESTIMATED EXTERNAL RADIATION DOSES & RADIATION DOSES RELEVANT TO 10 CFR32.23 & 32.24:

All information for this section remains exactly the same as previously approved by the U.S.N.R.C. for TRUGLO License #42-23889-01E and Registration Certificate #NR-1180-D-101-E dated 5-17-10 for TG131/231 Series gun sights.

QUALITY ASSURANCE AND CONTROL:

All information for this section remains exactly the same as previously approved by the U.S.N.R.C. for TRUGLO License #42-23889-01E and Registration Certificate #NR-1180-D-101-E dated 5-17-10 for TG131/231 Series gun sights.

As stated in Registration #NR-1180-D-101-E, "TRUGLO, Inc. has submitted a quality assurance and control (QA/QC) program that has been found to be acceptable by the NRC for the production and distribution of the TG-20, TG131 and TG231 Series sights by TRUGLO. A copy of this program is on file with the NRC."

ATTACHMENT "A"

TRITIUM VIAL ASSMEBLY

22 pages withheld in their entirety –
exemption (b)(4)

ATTACHMENT “F”

PROTOTYPE RESULTS

PROTOTYPE TEST RESULTS FOR TG13 SERIES

The prototype testing for the TG13 Series pursuant to 10 CFR 32.22 is listed below. Five sets of sights from each series were subjected to the tests below. Each sight was visually inspected between each test and after completion of all tests, to ensure that no detrimental effects to the GTLS had occurred. In summary, all sights passed. Visual inspections conducted in a darkroom, showed no reduction in light output or brightness. Pursuant to our discussions with Mr. Ashkeboussi on August 2, 2002 regarding the issuance of our License No. 42-23889-01E, it was determined that NUREG Guide 1556, Vol. 8, Sec. 9-10 provides for leak testing through light output and brightness observations. Therefore, visual inspections were completed in compliance with the above reference to ensure source integrity and safety.

Chemical: Each sight was immersed for 48 hours at room temperature in each of the following (i) gun oil, (ii) trichloroethylene, and (iii) a cleaning compound according to MIL-C-372B.

Temperature: The following tests were performed on each sight:

High Temperature: The temperature of the sights were raised from ambient to 120°C and held at such temperature for one hour.

Low Temperature: The temperature of the sights were lowered from ambient to -46°C and held at such temperature for 48 hours.

Humidity: The sights were placed in an environment of 100% relative humidity and a temperature of 42°C and held at such an environment for 48 hours.

Temperature Shock: The temperature of each sight was raised to 80°C and held at this temperature for 15 minutes. The sights were then transferred (within 15 seconds) to a cold chamber having a temperature of -46°C and held in this chamber for 15 minutes.

Vibration: Each sight was subjected to 10 cycles of simple harmonic motion having amplitude of 0.075 cm starting at 10 Hz, rising to 50 Hz, and decreasing back to 10 Hz in approximately one minute. In addition, each sight was subjected to a 30 minute cycle at 100 Hz. These tests were conducted in 3 planes.

Pressure: Each sight was placed in a test chamber and exposed to 0.25 and 2.0 Bar for 4 periods of 15 minutes each. The pressure was returned to atmosphere between each period.

Penetration: A hammer with a small point and weighing 14g was dropped from a height of 1 meter onto the exposed surface(s) of the light source(s).

Mechanical Shock: This test was performed with the sights attached to the gun. The gun was then dropped from two meters onto a mat with a durometer of 95 over a concrete floor. The gun was dropped at least 60 times in such a manner that it struck the surface at least 10 times in each of the following attitudes: (i) barrel vertical, muzzle down, (ii) barrel vertical, muzzle up, (iii) barrel horizontal, bottom up, (iv) barrel horizontal, bottom down, (v) barrel horizontal, left side up, and (vi) barrel horizontal, right side up.

Firing: This test was performed using a mechanical "impact" device fabricated to impart on the sights a kinetic energy of 55 ft-lbs. The sights were attached to a fixture that reproduced the effects of firing. Each set of sights was continuously cycled 5,000 times on the fixture. For reference, a .45 ACP caliber handgun weighing two pounds, and firing a 230 grain projectile produces a recoil of approximately 10 ft-lbs.

ATTACHMENT "G"

U.S.N.R.C. MATERIALS LICENSE

#42-23889-01E

MATERIALS LICENSE

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 36, 39, 40, and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations, and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

<p>Licensee</p> <p>1. TRUGLO, Inc.</p> <p>2. 710 Presidential Drive Richardson, Texas 75081</p>	<p>In accordance with application dated March 8, 2010</p> <p>3. License number 42-23889-01E is amended in its entirety to read as follows:</p> <p>4. Expiration date November 30, 2012</p> <p>5. Docket No. 030-36055 Reference No.</p>	
<p>6. Byproduct, source, and/or special nuclear material</p> <p>A. Hydrogen 3</p>	<p>7. Chemical and/or physical form</p> <p>A. Sealed self-luminous light sources (SRB Technologies Model M-1, and Mb-Microtec Model 400/1)</p>	<p>8. Maximum amount that licensee may possess at any one time under this license</p> <p>A. Not applicable (See Condition 11)</p>
<p>9. Authorized use:</p> <p>Pursuant to 10 CFR 32.22, "Specific Domestic Licenses to Manufacture or Transfer Certain Items Containing Byproduct Material", the licensee is authorized to distribute sealed self-luminous light sources in archery pins and gun sights manufactured in accordance with NRC Registration No. NR-1180-D-101-E containing sealed sources as specified in Condition 10 of this license to persons exempt from the requirements for a license pursuant to 10 CFR 30.19, or equivalent provisions of the regulations of any Agreement State.</p>		

CONDITIONS

10. The licensee is authorized to distribute the following series of self-luminous archery pin and gun sight devices:

<u>Device Model</u>	<u>Maximum Activity</u>
TG-20 Series (Bow Sights)	30 millicuries (1110 MBq) per bow sight
TG-20X Series (Bow Sights)	30 millicuries (1110 MBq) per bow sight
TG-131 Series (Gun Sights)	90 millicuries (3330 MBq) per gun sight device
TG-231 Series (Gun Sights)	90 millicuries (3330 MBq) per gun sight device

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**License Number
42-23889-01EDocket or Reference Number
030-36055

11. This license does not authorize possession or use of licensed material.
12. Licensed material shall be distributed only from the licensee's facility located at 710 Presidential Drive, Richardson, TX 75081.
13. The licensee shall file periodic reports as specified in 10 CFR 32.25(c):
14. Except as specifically provided otherwise by this license, the licensee shall conduct its program in accordance with the statements, representations, and procedures contained in the documents, including any enclosures, listed below. The U.S. Nuclear Regulatory Commission's regulations shall govern unless the statements, representations, and procedures in the licensee's application and correspondence are more restrictive than the regulations.
- A. Application dated June 12, 2002;
 - B. Letter dated August 29, 2002;
 - C. Letter dated September 26, 2002;
 - D. Letter dated May 20, 2003;
 - E. Letter dated September 11, 2003;
 - F. Letter dated October 14, 2003;
 - G. Letter dated January 25, 2005;
 - H. Letter dated June 17, 2005;
 - I. Letter dated November 30, 2005; and
 - J. Letter dated March 8, 2010.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

/RA/

Date May 17, 2010

By _____

Shirley S. Xu
License Branch
Division of Materials Safety and State Agreements
Office of Federal and State Materials and
Environmental Management Programs
Washington, DC 20555

ATTACHMENT "H"

TRUGLO
REGISTRATION
CERTIFICATE
NR-1180-D-101

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE
(AMENDED IN ITS ENTIRETY)

NO.: NR-118C-D-101-E DATE: April 12, 2010

PAGE 1 OF 6

DEVICE TYPE: Bow and Gun Sights

MODEL: TG-20 and TG-20X Series (bow sights)
 TG-131 and TG-231 Series (gun sights)

MANUFACTURER/DISTRIBUTOR: TRUGLO, Inc.
 710 Presidential Drive
 Richardson, TX 75081
 (formerly 13745 Neutron Road
 Dallas, TX 75244)

SEALED SOURCE MODEL DESIGNATION: SRB Technologies, Model M-1
 Mb-Microtec, Model 400/1

<u>ISOTOPE:</u>	<u>MAXIMUM ACTIVITY:</u>
Hydrogen-3	30 mCi (1110 MBq) per bow sight
	90 mCi (3330 MBq) per gun sight device (3x30 mCi)

LEAK TEST FREQUENCY: Not Required

PRINCIPAL USE: (W) Self-Luminous Light Source

CUSTOM SOURCE: _____ YES X NO

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
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NO.: NR-1180-D-101-E DATE: April 12, 2010

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DEVICE TYPE: Bow and Gun Sights

DESCRIPTION:

The TG-20 and TG-20X Series bow sights are primarily used by recreational hunters or target shooters to improve low-light shooting capability. The sight pins are mounted on archery sights and affixed to the bow. Likewise, the TG-131 and TG-231 Series gun sights are primarily used by recreational hunters or law enforcement personnel to improve low-light shooting capability. The front and rear gun sights are secured in a structural mounting and affixed to a gun.

The byproduct material is tritium (H-3) in gaseous form, sealed into borosilicate glass tubes. The sources used are Mb Microtec Model 400/1 (NRC registration certificate NR-446-S-102-S) or SRB Technology, Inc. Model M-1 registration certificate NC-585-S-102-S. The manufacturer states that the working life of a sight is indefinite, the decay half-life of tritium is 12.3 years. Each archery pin or front gun sight contains one source with a maximum activity of 30 mCi (1110 MBq). A rear gun sight combined activity of 60 mCi (2220 MBq). An individual gun may use one front and one rear sight, for a maximum combined activity of 90 mCi (3330 MBq).

In bow sights, the gaseous tritium light source (GTLS) units are placed in a structural mounting bracket of plastic tubing which is inserted into a steel casing. A gluing agent is used to permanently affix the plastic tubing in the steel casing. The sources are inaccessible to the user. The sight is mounted to the bow by means of a screw/clamp connection. The overall dimensions for the TG-20 Series are 1.2 inches in length and 0.2 inches in width. The TG-20X Series dimensions are 2 inches in length and 0.25 inches in width.

The TG-20 Series bow sights consist of three models. The difference between the three models is the shape of the base. The base may be square, rectangular, or round.

In gun sights, the GTLS units are placed in a structural mounting bracket of plastic tubing. A silicone gluing agent, acetoxy silicone rubber or equivalent, is used to permanently affix the GTLS in the plastic tubing. An acrylated urethane adhesive

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE
(AMENDED IN ITS ENTIRETY)

NO.: NR-1180-D-131-E DATE: April 12, 2010

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DEVICE TYPE: Bow and Gun Sights

DESCRIPTION (Cont.):

creates a lens at the end of the GTLS assembly. The plastic tubing and GTLS assembly is inserted into a metal gun sight housing. The housing is machined from 12L14 steel, or metal of equivalent physical and chemical properties, with a minimum wall thickness of 0.019 inches (0.048 cm). A silicone gluing agent affixes the GTLS to the metal housing. Finally, the GTLS is sealed in the metal housing with an elastomeric adhesive to make the sources inaccessible to the user. The maximum dimensions of a front gun sight are 1.3 inches (3.3 cm) length, 0.37 inches (0.94 cm) width and 0.78 inches (2.0 cm) height. The maximum dimensions of a rear gun sight are 1.3 inches (3.3 cm) length, 1.2 inches (3.0 cm) width and 0.88 inches (2.2 cm) height.

In the TG-131 and TG-231 Series gun sights both series have Models A1, A2 and A3 are front gun sights, containing one radioactive source, while B1 and B2 are rear gun sights containing two radioactive sources. Differing models have screw/clamp, stake or dovetail mounting connection. The TG-131 Series contains a fiber optic cable and the TG-231 Series does not. Additionally, TG-131 Series A and B sights contain Models TG-131AR, TG-131SG, TG-131ML, **TG-131ST1, TG-131ST2, TG-131HT, TG-131KT, TG-131XT, TG-131MPT, TG-131GT1, and TG-131GT2** with variations in physical configurations, mounting and routing of the fiber optic cable. TG-231 Series A and B sights contain Models **TG-231S1, TG-231S2, TG-231H, TG-231K, TG-231X, TG-231MP, TG-231G1, and TG-231G2** with variations in physical configurations and mounting.

LABELING:

Each sight is permanently marked with the Truglo logo "TG" and the symbol for tritium (H-3). The logo and H-3 are marked on the side of the bow sight plans and gun sights. In addition, packaging of the device will contain information identifying the fact that the device contains tritium gas along with the proper instruction for the return of an unwanted device or defective product back to the manufacturer for disposal.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE
(AMENDED IN ITS ENTIRETY)

NO.: NR-1180-D-101-E DATE: April 12, 2010

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DEVICE TYPE: Bow and Gun Sights

DIAGRAMS:

See Attachments 1 through 15.

PROTOTYPE TESTING:

Truglo performed the following prototype tests for all sights: temperature, humidity, temperature shock, pressure, penetration, and mechanical shock. In addition, vibration and firing tests were performed to establish the integrity of the gun sights.

The same sight pins were used for each test of the TG-20 Series. Five sets of sights from each of the two gun sight series, TG-131 and TG-231, were tested. A test set included two sights: one front sight (Model A1) and one rear sight (Model B1). Each of the gun sights tested used a stake mounting connection. Each sight was visually inspected between each test and after completion of all the tests to ensure that no detrimental effects occurred. The prototype testing exhibited no tritium leakage or breakage of the sight or source.

QUALITY ASSURANCE AND CONTROL:

TRUGLO, Inc. has submitted a quality assurance and control (QA/QC) program that has been found to be acceptable by NRC for production and distribution of sights by Truglo. A copy of this program is on file with the NRC.

SAFETY ANALYSIS SUMMARY:

Based on our review of the information provided and test data cited above, we conclude that TRUGLO, Inc.'s sight models meet the safety criteria set forth in 10 CFR 32.23. Furthermore, we conclude that the sealed tritium light sources would maintain containment integrity under normal conditions and accidental conditions of use. Therefore, we conclude that the bow sights and gun sights are acceptable for exempt licensing purposes.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE
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NO.: NR-1180-D-101-E DATE: April 12, 2010

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DEVICE TYPE: Bow and Gun Sights

REFERENCES:

The following supporting documents for TRUGLO, Inc. bow and gun sights are hereby incorporated by reference and are made a part of the registry document.

- TRUGLO, Inc. device registration and exempt materials license applications dated June 12, 2002, with enclosures thereto.
- TRUGLO, Inc. letters dated August 29, 2002 and September 26, 2002 with enclosures thereto.
- TRUGLO, Inc. device registration and exempt materials license amendment applications dated May 20, 2003, with enclosures thereto.
- TRUGLO, Inc. letters dated September 11, 2003, and October 14, 2003, with enclosures thereto.
- TRUGLO, Inc. electronics mails dated October 11, 2003, October 15, 2003, October 20, 2003, and October 28, 2003, with enclosures thereto.
- TRUGLO, Inc. letter dated January 25, 2005 and June 17, 2005 with enclosures thereto.
- TRUGLO, Inc. application dated November 30, 2005, and electronic mail dated January 23, 2006, with enclosures thereto.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE
(AMENDED IN ITS ENTIRETY)

NO.: NR-1180-D-101-E DATE: April 12, 2010

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DEVICE TYPE: Bow and Gun Sights

REFERENCES (Cont.):


- TRUGLO, Inc. application dated March 8, 2010, and electronic mails dated March 19, 2010 and March 23, 2010, with enclosures thereto.

ISSUING AGENCY:

U.S. Nuclear Regulatory Commission

Date: April 12, 2010

Reviewer: _____


John P. Jankovich

Date: April 12, 2010

Concurrence: _____


Viagar S. Bhachu

16 pages withheld in their entirety –
exemption (b)(4)



Department of State Health Services

RADIOACTIVE MATERIAL LICENSE

Pursuant to the Texas Radiation Control Act and Texas Department of State Health Services (Agency) regulations on radiation, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess and transfer radioactive material listed below; and to use such radioactive material for the purpose(s) and at the place(s) designated below. This license is subject to all applicable rules, regulations and orders of the Agency now or hereafter in effect and to any conditions specified below.

LICENSEE			This license is issued in response to an agency inspection	
1. Name	TRUGLO INC ATTN LORRAINE L HELLINGHAUSEN		Conducted on: March 23, 2010	
2. Address	710 PRESIDENTIAL DRIVE RICHARDSON TX 75081			
			3. License Number	Amendment Number
			L05519	07
PREVIOUS AMENDMENTS ARE VOID				
			4. Expiration Date	
			March 31, 2012	
RADIOACTIVE MATERIAL AUTHORIZED				
5. Radioisotope	6. Form of Material	7. Maximum Activity*	8. Authorized Use	
A. H-3	A. Sealed source (MB-Microtec Models 400/1, 400/2 and 400/3)	A. No single source to exceed 30 millicuries Total: 900 curies	A. Manufacture and storage of archery pins and gun sights containing self-luminous light sources pending distribution pursuant to U.S. Nuclear Regulatory Commission License No. 42-23889- 01E.	

9. Radioactive material shall only be stored and used at:

Site Number
001

Location
Richardson - 710 Presidential Drive

10. Each site shall maintain documents and records pertinent to the operations at that site. Copies of all documents and records required by this license shall be maintained for Agency review at Site 001.
11. The licensee shall comply with the provisions (as amended) of Title 25 Texas Administrative Code (TAC) §289.201, §289.202, §289.203, §289.204, §289.205, §289.251 and §289.252.
12. The individual designated to perform the functions of Radiation Safety Officer (RSO) for activities covered by this license is Lorraine L. Hellinghausen.
13. Radioactive material shall be used by, or under the direct supervision of, individuals designated by the RSO only after each worker has successfully completed a training course determined by the Agency as appropriate. Documentation verifying the successful completion of the training for each worker shall be maintained by the licensee for inspection by the Agency.
14. Sealed sources containing radioactive material shall not be opened.
15. The licensee shall conduct a physical inventory, at least every six months, to account for all sealed sources received and possessed under the license. The records of the inventories shall be maintained for inspection by the Agency for three years from the date of the inventory and shall include the radionuclide, number of curies, location of each source of radiation, the name of the individual making the inventory, and the date of the inventory.



Department of State Health Services

RADIOACTIVE MATERIAL LICENSE

LICENSE NUMBER	AMENDMENT NUMBER
L05519	07

16. The licensee shall conduct radiation contamination surveys of all radioactive material use and storage areas at intervals not to exceed 30 days or when it is suspected that a tritium light source has become compromised. Surveys shall be taken in the form of surface wipes using appropriate media for subsequent gas proportional counting or liquid scintillation counting. If analysis reveals the presence of radioactive contamination in excess of the limits contained in 25 TAC §289.202(ggg)(6), the licensee shall immediately enable contamination control actions and notify the agency of the analysis findings.
17. Except as specifically provided otherwise by this license, the licensee shall possess and use the radioactive material authorized by this license in accordance with statements, representations, and procedures contained in the following:

application dated January 21, 2002.

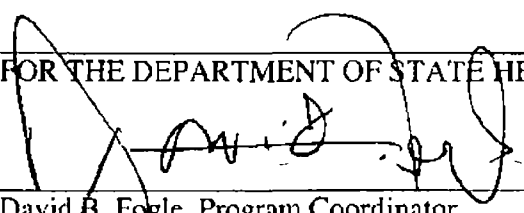
letters dated March 18, 2002, March 21, 2003, and January 25, 2005.

Title 25 TAC §289 (as amended) shall prevail over statements contained in the above documents unless such statements are more restrictive than the regulations.

KEE

FOR THE DEPARTMENT OF STATE HEALTH SERVICES

Date: August 17, 2010


David B. Fogle, Program Coordinator
Advanced Technology Licensing Program

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(b)(4)

of the Freedom of Information and Privacy Act

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6. Please provide two drawings which are not proprietary: one to represent the TG13 "A" Models and the other to represent the TG13 "B" models. These drawings (preferably in electronic format) should be suitable for incorporation in to the registration certificate.

Response:

The Title Block for the drawings has been updated to remove the proprietary clause. Please refer to attached documents entitled: "TG13 Series-A1 RevB.pdf" and "TG13 Series-B1 RevB.pdf".

Prototype Testing

7. The prototype test results for the TG13 Series stated that five sets of sights from each series were subjected to the test. Please identify which of the models were tested for each series and how many of each model.

Response:

Five sights from the TG13 Series A1 (TG13GL, Glock Front Sight) and five sights from the TG13 Series B1 (TG13GL, Glock Rear Sight.) were subjected to the prototype testing.

8. Prototypes tested must be representative of the products, in this case the product series. Please describe how the five sets (models) were chosen and how they were representative of the series. Provide an engineering analysis for the variations of the models in the series.

Response:

The most significant difference between all the TG13 Series sights is the mounting of the sight housing to the gun. The two models selected for testing had the minimum amount of material cross section to support the testing loads. Therefore, five sights of model TG13 A1 and five sights of model TG13 B1 were tested because these sights had the weakest mounting support to the gun. Since both models passed the USNRC testing criteria, it can be ascertained that all other models should pass because they have significantly stronger mounting supports to the gun.

Engineering Analysis for the Variations of Models Series

TG13 A1 = 0.015 in²
TG13 A2 = 0.039 in²
TG13 A3 = 0.041 in²
TG13 A4 = 0.062 in²
TG13 A5 = 0.067 in²
TG13 A6 = 0.035 in²

TG13 B1 = 0.127 in²
TG13 B2 = 0.706 in²

previously performed and submitted by 21st Century Technologies on behalf of TRUGLO, Inc. for approval by the NRC specifically for TRUGLO, Inc.. 21st Century Technologies received approval from the NRC for this exact device. Please reference Amendment No. 2 dated May 15, 2002 Reference No. 30-23697-01E; Docket or Reference Number 030-34261 of License Number 42-23850-02E. Therefore, no further prototype testing has been conducted. (Please see Attachment "J" for the documents pertaining to 21st Century Technologies.)

ESTIMATED EXTERNAL RADIATION DOSES:

The following information was obtained from referencing the ICRP Publication 30 – Limits for Intakes of Radionuclides By Workers, International Commission on Radiological Protection, Publication 30, 1978.

The radiation dose estimates associated with the GTLS and a comparison to the limits in Section 32.23 are presented here. The basis for these calculations are presented. The requirement addresses radiation exposure from both external sources and dose commitments from the intake of radioactive material. There is not external radiation dose from a GTLS due to the sort range of the low-energy beta emitted by the radioactive decay of tritium. Dose commitments are possible through several pathways including:

Inhalation of the tritium gas

Absorption through skin

Inhalation or Ingestion of tritium oxide as water or water vapor

The ICRP in Publication 30 presented the basis for dose modeling from these pathways and is the method endorsed by the NRC in setting their radiation standards. Using these techniques, limiting quantities of radioactive material allowed within a year and limiting concentrations in air through out the year were calculated.

Two separate models are used for elemental tritium and tritiated water. There is no established Annual Limit of Intake from exposure to elemental tritium. The ICRP explains that the exposure

to tritium gas only needs to be modeled as exposure to a cloud of gas. The total dose equivalent received from such an exposure is from tritium contained within the lung. Using this approach they established a Derived Air Concentration (DAC) for elemental tritium as 2×10^{10} Bq/m³.

A DAC is a derived limit chosen such that exposure to 2000 hours of this concentration in the air would result in a 5000 mrem committed dose equivalent. Comparison of this DAC with that of tritiated water provides a relative hazard index.

The DAC of 2×10^{10} Bq/m³ represents the complete contents of about 42 GTLS per cubic meter, assuming 15 mCi per device.

The DAC for tritiated water is 8×10^5 Bq/m³. The relative hazard between elemental tritium and tritiated water is therefore:

$$\frac{2 \times 10^{10}}{8 \times 10^5} = 25,000$$

with elemental tritium being the least hazardous. This is the form of tritium in the GTLS.

More information is available on the dosimetry of tritium oxide than for elemental tritium. For the oxide form an Annual Limit on Intake is given. This value represents the total quantity of material allowed to be taken in the body throughout the year which would result in a 5000 mrem committed effective dose equivalent. The ALI for tritium oxide is 3×10^9 Bq (the complete contents of four bow sights if the tritium was oxide.)

The internal dosimetry model for tritium oxide recommended by ICRP 30 assumes instantaneous mixing and distribution among all soft body tissues at any time following an intake, regardless of the route of entry. The retention of tritium in the body is described as a single exponential with a half-life of ten days.

For reference to man this model results in a committed dose equivalent of 1.8×10^{-11} Sv/Bq (IAEA91). This factor is similar to the exposure to dose conversion factor specified in Federal Guidance Report No. 11 (EPA88) which is 1.73×10^{-11} Sv/Bq. This factor is the same for inhalation and ingestion since tritium is assumed to be rapidly distributed within the body regardless of the route of entry.

The effects of exposure to a 13 mCi gaseous source may be made using the dose conversion factor for HTO and applying the relative hazard ratio of the gaseous form. Using the dose conversion factor of 1.73×10^{-11} Sv/Bq as defined by the EPA, the following estimate can be made:

$$13\text{mCi} \quad \begin{array}{c} 3.7 \times 10^7 \text{ Bq} \\ \times \\ \text{mCi} \end{array} \quad \begin{array}{c} 1.73 \times 10^{-11} \text{ Sv} \\ \times \\ \text{Bq} \end{array} \quad \begin{array}{c} 100 \text{ rem} \\ \times \\ \text{Sv} \end{array} = 0.832 \text{ rem}$$

The dose conversion factor used only applies to tritium oxide, but are the only values quoted. Applying the 25000:1 reduction for tritium gas would result in:

$$13\text{mCi} \quad \begin{array}{c} 3.7 \times 10^7 \text{ Bq} \\ \times \\ \text{mCi} \end{array} \quad \begin{array}{c} 1.73 \times 10^{-11} \text{ Sv} \\ \times \\ \text{Bq} \end{array} \quad \begin{array}{c} 100 \text{ rem} \\ \times \\ \text{Sv} \end{array} \quad \begin{array}{c} 1000 \text{ mrem} \\ \times \\ \text{rem} \end{array} \quad \begin{array}{c} 1 \\ 25000 \text{ mrem} \end{array} = 0.033$$

from the total intake of 1 GTLS source at its maximum activity.

The ICRP also states that exposure to tritiated water vapor results in 3×10^{-2} Bq/min absorbed for each Bq/m³ in the air. Assuming a 13 mCi GTLS was broken and all converted to oxide in volume of 2 m³ and ten minutes exposure, the resultant intake would be:

$$3 \times 10^{-2} \times \frac{13\text{mCi}}{2\text{m}^3} \times \frac{3.7 \times 10^7 \text{ Bq}}{\text{mCi}} \times 10 \text{ minutes} = 7.2 \times 10^7 \text{ Bq.}$$

Applying the dose conversion factor for oxide, one obtains:

$$1.73 \times 10^{-11} \text{ Sv}$$

$$7.2 \times 10^7 \text{ Bq} \times \frac{\text{-----}}{\text{Bq}} = 1.25 \times 10^{-3} \text{ Sv} = 0.125 \text{ rem} = 125 \text{ mrem}$$

These models are conservative because they do not account for the conversion of elemental tritium to oxide over time. Following a broken GTLS, the tritium gas would be readily dispersed and diluted. The actual dose would be much lower.

Little actual data exists where exposure to a broken GTLS is estimated, but in one reported experiment Skibin (Skibin73) estimated the dose to an individual from crushing two 12 mCi sources (24 mCi total). Skibin estimates that if an individual was contained in a 12 m³ plastic tent for over two hours following the crushing of these sources, he would receive about a 5 mrem exposure.

The dose limits established to demonstrate compliance with the licensing requirements are given in 10CFR Section 32.23. The normal use and disposal of a single unit can not result in more than 1 mrem/year to the whole body or 3 mrem per year to any organ (lung). During normal use there would be negligible dose since there is no external radiation hazard from tritium. The estimated dose for the intake of a single unit as calculated above was 0.03 mrem.

The dose limit allowed for the accumulation of a quantity of units is 10 mrem. At 0.03 mrem per device, this would allow for 3,333 units in one location to fail creating a cloud of elemental gas with no subsequent actions of individuals to reduce their dose.

A dose limit of 500 mrem is applied to hypothetical failure of a container and shielding. This limit would allow the simultaneous crushing of 16,666 units in one location with no action by an individual to reduce their dose.

(See Attachment "K")

REFERENCES

- EPA88 Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion, and Ingestion. Federal Guidance Report No. 11, EPA-520/1-88-020, September 1988.
- Evans66 Evans, E.A., Tritium and Its Compounds, D. Van Nostrand Company, Inc. 1966 and 1974.
- HEW1970 Radiological Health Handbook, U.S. Department of Health, Education and Welfare, 1970.
- IAEA91 Safe Handling of Tritium, Review of Data and Experience, IAEA Technical Reports Series No. 324. International Atomic Energy Agency, Vienna, 1991.
- ICRP78 Limits for Intakes of Radionuclides by Workers, International Commission on Radiological Protection, Publication 30, 1978.
- NCRP76 Tritium Measurement Techniques, National Council on Radiation Protection and Measurement, NCRP Report No. 47, 1976. Second printing 1988.
- NCRP79 Tritium and Other Radionuclide labeled Organic Compounds Incorporated into Genetic Material, National Council on Radiation Protection and Measurements, Report No. 63, 1979.
- NCRP87 Radiation Exposure of the U.S. Population from Consumer Products and Miscellaneous Sources, National Council on Radiation Protection and Measurement, NCRP Report No. 95, 1987.
- Skibin73 Skibin, D., Hazards from Rupture of a Tritium Activated Light Source, Health Physics, Vol. 25, No. 2, pp 184-186, 1973
- UNSCEAR 77 Sources and Effects of Ionizing Radiation, United Nations Scientific Committee of Atomic Radiation 1977 report to the General Assembly, with annexes. 1977

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(b)(4)

of the Freedom of Information and Privacy Act

From: Lorraine Hellinghausen
To: Sepulveda, Lymari
Cc: Arribas-Colon, Maria; Herrera, Tomas
Subject: RE: Request for clarification
Date: Tuesday, June 10, 2014 2:18:09 PM
Attachments: FW: TRUGLO INC. REQUEST FOR AMENDMENT - MAIL CONTROL 582795.msg

Dear Sirs.

These statements are applicable to the new sites. We confirm the sites are made of steel grade 12L14.

(b)(4)

We thank you in advance for your time and consideration.

We remain at your disposal.

Kindest regards,
Lorraine Hellinghausen

From: Sepulveda, Lymari [mailto:Lymari.Sepulveda@nrc.gov]
Sent: Tuesday, June 10, 2014 9:15 AM
To: Lorraine Hellinghausen
Cc: Arribas-Colon, Maria; Herrera, Tomas
Subject: Request for clarification

Ms. Hellinghausen,

In order to amend your current registration certificate we need additional clarification. (b)(4)

(b)(4)

Thanks,
Lymari Sepulveda
General Engineer
U.S. Nuclear Regulatory Commission
FSME/MSSA/LB
(301)415-5619

From: Lorraine Hellinghausen
To: Vazquez, Justin
Subject: FW: TRUGLO INC. REQUEST FOR AMENDMENT - MAIL CONTROL 582795
Attachments: 2014 TRUGLO RAI REQUEST - FINAL.pdf

Dear Justin:
Please advise the status of our Request for Amendment.
Thank you.

Kindest regards,
Lorraine Hellinghausen

From: Lorraine Hellinghausen
Sent: Wednesday, May 07, 2014 5:25 PM
To: Vazquez, Justin
Subject: RE: TRUGLO INC. REQUEST FOR AMENDMENT - MAIL CONTROL 582795

Dear Justin:

I have sent our reply via Fed Ex Overnight Tracking # 798787182815.
I have also attached a PDF file for your convenience.

Per our discussion, please do everything in your power to process this RAI as quickly as possible. We did not anticipate the approval process to take this long regarding this type of what we consider to be a "courtesy" request for amendment. Although we respectfully understand that your agency has complied within regulatory timelines, in the past approval for this type of amendment would have already been issued by this point in time. (b)(4)

(b)(4)

(b)(4)

We thank you in advance for your time and consideration.
We remain at your disposal for any further questions.

Kindest regards,
Lorraine Hellinghausen

From: Vazquez, Justin [<mailto:Justin.Vazquez@nrc.gov>]
Sent: Tuesday, April 22, 2014 6:38 AM
To: Lorraine Hellinghausen
Subject: RE: TRUGLO INC. REQUEST FOR AMENDMENT - MAIL CONTROL 582795

Ms. Hellinghausen,

Attached you will find a copy of the RAI.

Best Regards,
Justin Vazquez

--

Justin Vazquez
U.S. Nuclear Regulatory Commission
(301)415-6684
TWFN-8G08

From: Lorraine Hellinghausen [<mailto:lhellinghausen@truglo.com>]
Sent: Monday, April 21, 2014 6:44 PM
To: Vazquez, Justin
Subject: RE: TRUGLO INC. REQUEST FOR AMENDMENT - MAIL CONTROL 582795

Thank you.

I tried to access the document under ADAMS using the Accession # provided. No such match. Can you email me the RAI so we can begin the process of providing you the information that you need?
Thank you.

Kindest regards,
Lorraine Hellinghausen

From: Vazquez, Justin [<mailto:Justin.Vazquez@nrc.gov>]
Sent: Monday, April 21, 2014 5:30 PM
To: Lorraine Hellinghausen
Cc: Xu, Shirley
Subject: RE: TRUGLO INC. REQUEST FOR AMENDMENT - MAIL CONTROL 582795

Ms. Hellinghausen,

This morning, we completed our initial review and drafting of a request for additional information (RAI) regarding your application for an amendment to your Exempt Distribution license and your Sealed Source and Device (SS&D) registration certificate. The letter containing this request was sent out today, and it should be delivered to you shortly.

If you wish to access the letter and RAI presently, they are available through our Agencywide Document Access and Management System (ADAMS), under Accession #ML14084A571. Using this accession number, you can find the document by performing a search through our public website, <http://www.nrc.gov>.

If you have any further questions or require further assistance, please do not hesitate to contact me.

Best Regards,
Justin Vazquez
Licensing Branch
Division of Materials Safety and State Agreements
Office of Federal and State Materials and Environmental Management
U.S. Nuclear Regulatory Commission
(301)415-6684

From: Lorraine Hellinghausen [<mailto:lhellinghausen@truglo.com>]
Sent: Monday, April 21, 2014 5:33 PM
To: Xu, Shirley; Vazquez, Justin
Subject: TRUGLO INC. REQUEST FOR AMENDMENT - MAIL CONTROL 582795

Dear Ms. Xu and Mr. Vazquez:

I am kindly requesting on behalf of TRUGLO, Inc. an update regarding the status of our Request for Amendment dated 12-31-14.

Mail Control: 582795
TRUGLO, Inc.
License #42-23889-01E

We remain at your disposal.

Kindest regards,
Lorraine Hellinghausen
Radiation Safety Officer

TRUGLO - Block Flouresent



525 International Parkway
Richardson, Texas 75081
<mailto:lhellinghausen@truglo.com>
P# 972.774.0300
F# 972.774.0323
www.truglo.com