DEPARTMENT OF THE ARMY
PROJECT MANAGER
NIGHT VISION/RECONNAISSANCE, SURVEILLANCE
AND TARGET ACQUISITION
10221 BURBECK ROAD
FORT BELVOIR, VIRGINIA 22060-5806

REPLY TO
ATTENTION OF

SFAE-IEW&S-NV-SGF 8 September 2000

MEMORANDUM FOR Nuclear Regulatory Commission Division of Nuclear Materials Safety, Glendale Road King of Prussia, PA 19406

SUBJECT: Request for Interpretation

030-29741

1. References:
   a. Code of Federal Regulations 10CFR part 40.13,
   b. U.S. NRC Materials License 29-01022-14, Amendment No. 18,
   c. Telephone conversation between Ms. Pam Henderson, NRC, and Dr. Dan Grogan, U.S. Army Office of Product Manager FLIR, 22 August 2000.

2. Request your office render an interpretation as to this Product Office's exemption from 10CFR part 40 and the requirements for a license as they pertain to the inclusion of thorium in finished optical lenses used in the 2nd Generation Forward Looking Infrared (FLIR) B-Kit. The exemption derives from the provisions of part 40.13, "Unimportant quantities of source material."

3. The optical lenses in question are constituents of the B-Kit's Afocal Telescope Assembly. Lens elements are either diamond point turned or conventionally ground from germanium and zinc selenide, coated with a thorium fluoride antireflection optical filter, and then fashioned into finished optical lenses—two singlets, a doublet, and a triplet. The lenses are then installed into a housing, along with some electronic circuitry, to constitute a compact, high performance optical subsystem which relays the scene to an Imager Assembly, and thence to some platform-specific display device—CRT, flat panel display, etc.—for viewing by the operator.

4. The weight of the complete Afocal Telescope Assembly is 3.859 kg, and that of the lenses themselves is 1.0946 kg. The total amount of thorium used in the optical coatings is 280 mg, or 0.026% of the weight of the lenses. The coating is an integral part of the final lens, specifically called out in the lens drawings. As such, it will not be shaped, ground, or polished, or otherwise altered once installed into the Afocal Telescope Assembly. The fact that the percentage of thorium by weight of the finished optical lenses is far below the 30% limit specified in Ref. 1, paragraph (c) (7), and that the limitations of subparagraphs (i) and (ii) of that paragraph are complied with, strongly

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suggest that the thorium used in the Afocal Telescope Assembly should be considered an 'unimportant quantity of source material'. As such, an exemption from 10CFR part 40 and the requirement for a license would seem to be warranted.

5. A U.S. Nuclear Regulatory Commission Materials License, NRC Form 374, has been issued to the US Army Communications-Electronics Command (Ref. 2). Line S of this license relates to optical coatings on thermal imaging devices. It restricts the use of thorium 232, in the form of solid thorium fluoride, to an amount not to exceed 3 grams per optical system and 40 kilograms total. With the amount of thorium per B-Kit Afocal Telescope Assembly less than one one-thousandth of license limit, the desired interpretation of exemption in no way conflicts with the provisions of this license.

6. I would greatly appreciate your prompt attention to this matter. Some major remedial activities may need to be initiated immediately by this Product Office depending on the interpretation you render. My point of contact at this Office is Dan Grogan, 703-704-2484. Please do not hesitate to contact him should clarification or additional information be required.

CAMILLE M. NICHOLS
LTC, EN
Product Manager, Forward
Looking Infrared

Encl

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Amendment No. 18

CORRECTED COPY

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. U.S. Army Communication-Electronics Command 2 AMSEL-SF Fort Monmouth, New Jersey 07703-5024	In accordance with the letter dated July 14, 1999, 3. License number 29-01022-14 is amended in its entirety to read as follows: 4. Expiration date October 31, 2003 5. Docket No. 030-29741 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. Cobalt 60	A.	A.
B. Cobalt 60	B.	B.
C. Cobalt 60	C.	C.
D. Krypton 85	D. Sealed sources (USAEA Dwg. No. B124-12-8)	D. Not to exceed 6 millicuries per source and 120 curies total
E. Strontium 90	E.	E.
F. Strontium 90	F. Sealed sources (ECOM Dwg. No. SM-B-509048)	F. Not to exceed 150 microcuries per source and 45 millicuries total

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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
G. Strontium 90	G.	G.
H. Strontium 90	H. Sealed sources (3M Dwg., No. 12-1921-0474-8)	H. Not to exceed 36 microcuries per source and 18 millicuries total
I. Cesium 137	I.	I.
J. Cesium 137	J.	J.
K. Plutonium 239	K. Electroplated sources (Eberline Instrument Corp., Model 594-1)	K. Not to exceed 23 micrograms (1.4 microcuries) per set and 0.0115 grams total
L. Americium 241	L. Sealed sources (Amersham Radiochemical Center, Amersham Code 2084)	L. Not to exceed 10 millicuries per source and 50 millicuries total
M. Americium 241	M. Sealed sources (Amersham Model AMR 8122)	M. Not to exceed 1 microcurie per source and 100 microcuries total
N. Americium 241	N. Sealed sources (Amersham Model AMRB 8152)	N. Not to exceed 10 microcuries per source and 50 microcuries total
O. Amencium 241	O. Sealed sources (Amersham Model AMRB 1659)	O. Not to exceed 20 microcuries per source and 100 microcuries total
P. Thorium 230	P. Electroplated source (Eberline Instrument Corp., Model No. CS-12)	P. Not to exceed 0.98 micrograms (20 nanocuries) per source and 1 milligram total

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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
Q Thorium 232	Q. Metal foils	Q. Not to exceed 2.7 grams (300 nanocuries) per source and 4.05 kilograms total
R. Plutonium 239	R. Electroplated sources (Eberline Instrument Corp., Model No. CS-1)	R. Not to exceed 163 nanograms (10 nanocuries) per source and 1 gram total
S. Thorium 232	S. Solid (Thorium Fluoride coating on optical systems)	S. Not to exceed 3 grams (0.330 microcuries) per optical system and 40 kilograms total
T Cesium 137	T.	T.
U. Cesium 137	U.	U.
V. Hydrogen 3	V. Tritiated paint in Lensatic Compasses (NSN 6605-00-846-7618)	V. 120 millicuries per compass and 480 curies total
W. Hydrogen 3	W. Sealed light sources in Lensatic Compasses (NSN-6605-00-151-5337)	W. 190 millicuries per compass and 5700 curies total
X. Depleted Uranium	X. Metal	X. 1870 kilograms

9. Authorized use:

A through R. Calibration and operational checking of radiation detection instrumentation.
S Optical coating on thermal imaging devices.
T. For use in FEMA Model CDV-794 calibrators for instrument calibrations.
U. For use in FEMA Model CDV-790 calibrators for instrument calibrations.
V and W For Possession, storage, and distribution to any U.S. Department of Defense elements and reserve components including the U.S. Army, U.S. Navy, U.S. Marine Corps, U.S. Air Force, Defense Supply Agency, the National Guard and the Air National Guard.
X. Shielding for CDV-794 instrument calibrator.

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CONDITIONS

10. Licensed material may be used only at the licensee's facilities located at Fort Monmouth, New Jersey, and at Department of Defense installations anywhere in the United States.

11. A Licensed material shall only be used by, or under the supervision and in the physical presence of, individuals who have completed the training described in application dated July 20, 1992 and letter dated May 1, 1998, with enclosures.

B The Radiation Safety Officer for this license is Joseph M. Santarsiero.

12. A Sealed sources and detector cells containing licensed material shall be tested for leakage and/or contamination at intervals not to exceed six months or at such other intervals as are specified by the certificate of registration referred to in 10 CFR 32.210, not to exceed three years.

B. Notwithstanding Paragraph A of this Condition, sealed sources designed to emit alpha particles shall be tested for leakage and/or contamination at intervals not to exceed three months.

C In the absence of a certificate from a transferor indicating that a leak test has been made within six months prior to the transfer, a sealed source or detector cell received from another person shall not be put into use until tested.

D. Each sealed source fabricated by the licensee shall be inspected and tested for construction defects, leakage, and contamination prior to any use or transfer as a sealed source.

E. Sealed sources and detector cells need not be leak tested if:

(I) they contain only hydrogen-3; or

(ii) they contain only a radioactive gas; or

(iii) the half-life of the isotope is 30 days or less; or

(iv) they contain not more than 100 microcuries of beta and/or gamma emitting material or not more than 10 microcuries of alpha emitting material; or

(v) they are not designed to emit alpha particles, are in storage, and are not being used. However, when they are removed from storage for use or transfer to another person, and have not been tested within the required leak test interval, they shall be tested before use or transfer. No sealed source or detector cell shall be stored for a period of more than 10 years without being tested for leakage and/or contamination.

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F. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. If the test reveals the presence of 0.005 microcurie or more of removable contamination, a report shall be filed with the U.S. Nuclear Regulatory Commission and the source or detector cell shall be removed immediately from service and decontaminated, repaired, or disposed of in accordance with Commission regulations. The report shall be filed within five days of the date the leak test result is known with the U.S. Nuclear Regulatory Commission, Region I, ATTN: Director, Division of Nuclear Materials Safety, 475 Allendale Road, King of Prussia, Pennsylvania 19406. The report shall specify the source or detector cell involved, the test results, and corrective action taken.

G. The licensee is authorized to collect leak test samples for analysis by licensee. Alternatively, tests for leakage and/or contamination may be performed by persons specifically licensed by the Commission or an Agreement State to perform such services.

13. Sealed sources or detector cells containing licensed material shall not be opened or sources removed from source holders by the licensee.

14. The licensee shall conduct a physical inventory every six months to account for all sealed sources and devices containing licensed material received and possessed under the license.

15. The licensee shall not acquire licensed material in a sealed source or device unless the source or device has been registered with the U.S. Nuclear Regulatory Commission pursuant to 10 CFR 32.210 or equivalent regulations of an Agreement State.

16. The licensee is authorized to transport licensed material in accordance with the provisions of 10 CFR Part 71, "Packaging and Transportation of Radioactive Material."

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17. Except as specifically provided otherwise in 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 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 July 20, 1992
B. Letter dated June 15, 1993
C. Letter dated April 6, 1994
D. Letter dated February 28, 1997
E. Letter dated July 30, 1997
F. Letter dated August 27, 1997, with attachment
G. Letter dated September 10, 1997
H. Letter dated May 1, 1998
I. Letter dated July 2, 1998
J. Letter dated May 13, 1998, with attached survey report
K. Letter dated July 14, 1999 with attached survey report
L. Letter dated September 1, 1999
M. Letter dated September 10, 1999

For the U.S. Nuclear Regulatory Commission

Date February 2, 2000

By ***Original signed by Judith A. Joustra***

Judith A. Joustra
Nuclear Materials Safety Branch 2
Division of Nuclear Materials Safety
Region I
King of Prussia, Pennsylvania 19406

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