



TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION  
 DIVISION OF RADIOLOGICAL HEALTH  
 WILLIAM R. SNODGRASS TENNESSEE TOWER, 15<sup>th</sup> FLOOR  
 312 ROSA L. PARKS AVENUE, NASHVILLE, TN 37243

## RADIOACTIVE MATERIAL LICENSE

### Amendment 20

Pursuant to Tennessee Department of Environment and Conservation Regulations, 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 and regulations of the Tennessee Department of Environment and Conservation and orders of the Division of Radiological Health, now or hereafter in effect and to any conditions specified below.

LICENSEE		3. License number R-01097-B14 amended in its entirety
1. Name	<b>FLIR Detection, Inc.</b>	4. Expiration date February 28, 2014
2. Address	100 Midland Road Oak Ridge, Tennessee 37830	5. File no. R-01097
6. Radioactive Material (Element and Mass Number)	8. Chemical and/or physical form	9. Maximum Radioactivity and/or quantity of material which licensee may possess at any one
See Supplementary Sheets		
10. Authorized Use		
See Supplementary Sheets		

#### CONDITIONS

11. Unless otherwise specified, the authorized place of use is the licensee's address stated in Item 2 above.

See Supplementary Sheets

For the Commissioner  
 Tennessee Department of Environment and Conservation

Date of Issuance January 3, 2014

By: Charles Arnott  
 Division of Radiological Health  
 Charles Arnott  
 Health Physicist

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6. Radioactive Material (Element and Mass Number)	8. Chemical and/or Physical Form	9. Maximum Radioactivity and/or Quantity of Material Which Licensee May Possess at <u>Any One Time</u>
A. Ba-133 Cd-109 Co-57 Co-60 Cs-134 Cs-137 Eu-152 Eu-155 Fe-55 Kr-85 Mn-54 Na-22 Ra-226 Zn-65 Or other sources listed in Schedule RHS 8-3 of "State Regulations for Protection Against Radiation"	A. Sealed source (Spectrum Techniques or other vendor authorized to distribute exempt quantity sources in a license issued by the U.S. Nuclear Regulatory Commission or an Agreement State)	A. No single source to exceed the exempt quantity limit for that radionuclide as listed in Schedule RHS 8-3 of "State Regulations for Protection Against Radiation," except for Ra-226 which is not to exceed 0.01 microcurie. Total not to exceed 1 millicurie.
B. Californium 252	B. Sealed source (AEA Technology QSA Inc. Model CVN.CY2)	B. Two (2) sources not to exceed 64 microcuries each. One (1) source not to exceed 6 microcuries. Total not to exceed 134 microcuries.
C. Americium 241	C. Sealed source (QSA Global Inc. VZ-477/2)	C. Ten (10) sources not to exceed 1 microcurie each.
D. Cesium 137	D. Sealed source (QSA Global Inc. VZ-130/2)	D. Four (4) sources not to exceed 100 microcuries each.



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E. Thorium 232	E. Sealed source (QSA Global Diagram No. VZ-3309-001)	E. Five (5) sources not to exceed 9.3 microcuries each, and Five (5) sources not to exceed 2.33 microcuries each.
F. Americium 241	F. Sealed source (QSA Global Model AMCL, Capsule X131/4)	F. One (1) source not to exceed 100 millicuries.
G. Cesium 137	G. Sealed source (QSA Global Model CDC.P4, Capsule VZ-1508/2)	G. One (1) source not to exceed 10 millicuries.
H. Cobalt 60	H. Sealed source (QSA Global Model CKC.P4, Capsule VZ-1486/3)	H. One (1) source not to exceed 5 millicuries.
I. Americium 241	I. Solid (Type A-2 disk, Eckert & Ziegler Isotope Products)	I. One (1) source not to exceed 0.1 microcurie.
J. Americium 241	J. Sealed source (Eckert & Ziegler Type D disk)	J. Six (6) sources not to exceed 100 microcuries each. Five (5) sources not to exceed 5 microcuries each.
K. Cobalt 60	K. Sealed source (Eckert & Ziegler Type D disk)	K. Six (6) sources not to exceed 100 microcuries each.
L. Europium 152	L. Sealed source (Eckert & Ziegler Type D disk)	L. Six (6) sources not to exceed 100 microcuries each.
M. Holmium 166m	M. Sealed source (Eckert & Ziegler Type D disk)	M. Two (2) sources not to exceed 10 microcuries each.
N. Radium 226	N. Sealed source (Eckert & Ziegler Type D disk)	N. Two (2) sources not to exceed 10 microcuries each. Five (5) sources not to exceed 0.6 microcurie each.





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O. Uranium 235	O. Sealed source (Eckert & Ziegler Type D disk)	O Two (2) sources not to exceed 100 nanocuries each.
P. Uranium 238	P. Sealed source (Eckert & Ziegler Type D disk)	P. Two (2) sources not to exceed 100 nanocuries each.
Q. Strontium 90	Q. Sealed source (Eckert & Ziegler Type D disk)	Q. Two (2) sources not to exceed 10 microcuries each.
R. Cesium 137	R. Any	R. Ten (10) sources not to exceed 100 microcuries each.
S. Am-241: Be	S. Sealed source (Eckert & Ziegler Model Am1.N02)	S. One (1) source not to exceed 11.5 millicuries)

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10. Authorized use

A. through S. In-house detector testing. Instrumentation research and development.

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Conditions (continued)

12. The licensee shall comply with applicable provisions of 0400-20-04, 0400-20-05, and 0400-20-10 of "State Regulations for Protection Against Radiation."
13. A. Radioactive material authorized by this license shall be used by individuals who have been trained as referenced in Condition 20 of this license.  
B. The Radiation Safety Officer for this license is Jeffrey R. Preston. The Assistant Radiation Safety Officer for this license is Steven Read.
14. Licensed material shall be stored in accordance with statements, representations, and procedures contained in documents referenced in Condition 20 of this license.
15. The licensee shall not open sealed sources containing radioactive material.
16. The licensee shall conduct a physical inventory of all sources possessed under this license at intervals not to exceed six months. A record of this inventory shall be maintained for inspection by the Department.



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License Number **R-01097-B14**

17. A. Sealed sources authorized by this license shall be tested for leakage and/or contamination at intervals not to exceed six months. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to transfer, the sealed source shall not be put into use until tested.
- B. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. The test sample shall be taken from the sealed source or from the surface of the device in which the sealed source is permanently mounted or stored on which one might expect contamination to accumulate. Records of leak tests shall be kept in units of microcuries and maintained for inspection by the Department.
- C. If the test reveals the presence of 0.005 microcurie of more of removable contamination the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Department regulations. A report shall be filed within five days of the test with the Tennessee Department of Environment and Conservation, Division of Radiological Health, **William R. Snodgrass Tennessee Tower, 15<sup>th</sup> Floor, 312 Rosa L. Parks Avenue**, Nashville, Tennessee 37243, describing the equipment involved, the test results, and the corrective action taken.
- D. Tests for leakage and/or contamination shall be performed by persons specifically authorized by this Department, the U.S. NRC, or another Agreement State to perform such services.
18. Notwithstanding the periodic leak test required by Condition 17, any licensed sealed source is exempt from such leak tests when the source contains 100 microcuries or less of beta and/or gamma emitting material or 10 microcuries or less of alpha emitting material.
19. No provision of this license relieves the licensee from compliance with other Federal, State and local laws, ordinances, and regulations applicable to the licensee's activities.
20. Except as specifically provided otherwise by this license, the licensee shall possess and use radioactive material described in Items 6, 8, and 9 of this license in accordance with statements, representations, and procedures contained in the following:
- Application dated November 19, 2003, with attachments
  - Facsimile received October 5, 2007
  - Letters dated April 27, 2004, with attachments, May 28, 2004, with attachments, July 1, 2004, October 10, 2004, with attachment, May 5, 2005, with attachment, January 29, 2007, with attachments, May 18, 2007, with attachment, October 3, 2007, July 21, 2008, with attachments, August 14, 2008, August 19, 2008, September 26, 2008, and December 30, 2008, October 23, 2009, with attachments, August 26, 2010, with attachments, March 29, 2010 (received March 30, 2011), with attachments, July 31, 2012, January 11, 2013, April 16, 2013, with attachments, May 14, 2013, with attachments, and **December 31, 2013, with attachments.**