

030-36509

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| <p><b>NRC FORM 313</b><br/>(3-2009)<br/>10 CFR 30, 32, 33,<br/>34, 35, 36, 39, and 40</p> <p style="text-align: center;"><b>U.S. NUCLEAR REGULATORY COMMISSION</b></p> <p style="text-align: center;"><b>APPLICATION FOR MATERIALS LICENSE</b></p> | <p><b>APPROVED BY OMB: NO. 3150-0120</b> <span style="float: right;"><b>EXPIRES: 3/31/2012</b></span></p> <p>Estimated burden per response to comply with this mandatory collection request: 4.3 hours. Submittal of the application is necessary to determine that the applicant is qualified and that adequate procedures exist to protect the public health and safety. Send comments regarding burden estimate to the Records and FOIA/Privacy Services Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects.resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0120), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.</p> |
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**INSTRUCTIONS: SEE THE APPROPRIATE LICENSE APPLICATION GUIDE FOR DETAILED INSTRUCTIONS FOR COMPLETING APPLICATION. SEND TWO COPIES OF THE ENTIRE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW.**

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| <p><b>APPLICATION FOR DISTRIBUTION OF EXEMPT PRODUCTS FILE APPLICATIONS WITH:</b></p> <p>OFFICE OF FEDERAL &amp; STATE MATERIALS AND ENVIRONMENTAL MANAGEMENT PROGRAMS<br/>DIVISION OF MATERIALS SAFETY AND STATE AGREEMENTS<br/>U.S. NUCLEAR REGULATORY COMMISSION<br/>WASHINGTON, DC 20555-0001</p> <p><b>ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS:</b></p> <p><b>IF YOU ARE LOCATED IN:</b></p> <p>ALABAMA, CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, FLORIDA, GEORGIA, KENTUCKY, MAINE, MARYLAND, MASSACHUSETTS, NEW HAMPSHIRE, NEW JERSEY, NEW YORK, NORTH CAROLINA, PENNSYLVANIA, PUERTO RICO, RHODE ISLAND, SOUTH CAROLINA, TENNESSEE, VERMONT, VIRGINIA, VIRGIN ISLANDS, OR WEST VIRGINIA, SEND APPLICATIONS TO:</p> <p>LICENSING ASSISTANCE TEAM<br/>DIVISION OF NUCLEAR MATERIALS SAFETY<br/>U.S. NUCLEAR REGULATORY COMMISSION, REGION I<br/>475 ALLENDALE ROAD<br/>KING OF PRUSSIA, PA 19406-1415</p> | <p><b>IF YOU ARE LOCATED IN:</b></p> <p>ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR WISCONSIN, SEND APPLICATIONS TO:</p> <p>MATERIALS LICENSING BRANCH<br/>U.S. NUCLEAR REGULATORY COMMISSION, REGION III<br/>2443 WARRENVILLE ROAD, SUITE 210<br/>LISLE, IL 60532-4352</p> <p>ALASKA, ARIZONA, ARKANSAS, CALIFORNIA, COLORADO, HAWAII, IDAHO, KANSAS, LOUISIANA, MISSISSIPPI, MONTANA, NEBRASKA, NEVADA, NEW MEXICO, NORTH DAKOTA, OKLAHOMA, OREGON, PACIFIC TRUST TERRITORIES, SOUTH DAKOTA, TEXAS, UTAH, WASHINGTON, OR WYOMING, SEND APPLICATIONS TO:</p> <p>NUCLEAR MATERIALS LICENSING BRANCH<br/>U.S. NUCLEAR REGULATORY COMMISSION, REGION IV<br/>612 E. LAMAR BOULEVARD, SUITE 400<br/>ARLINGTON, TX 76011-4125</p> |
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**PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSED MATERIAL IN STATES SUBJECT TO U.S. NUCLEAR REGULATORY COMMISSION JURISDICTIONS.**

|   |   |
|---|---|
| <p>1. THIS IS AN APPLICATION FOR (Check appropriate item)</p> <p><input type="checkbox"/> A. NEW LICENSE</p> <p><input checked="" type="checkbox"/> B. AMENDMENT TO LICENSE NUMBER <u>41-25639-01E</u></p> <p><input type="checkbox"/> C. RENEWAL OF LICENSE NUMBER _____</p> | <p>2. NAME AND MAILING ADDRESS OF APPLICANT (Include ZIP code)</p> <p><b>FLIR Radiation, Inc. (formally ICx Radiation, Inc)</b><br/><b>100 Midland Road,</b><br/><b>Oak Ridge, TN 37830</b></p> |
| <p>3. ADDRESS WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED</p> <p><b>FLIR Radiation, Inc. (formally ICx Radiation, Inc)</b><br/><b>100 Midland Road,</b><br/><b>Oak Ridge, TN 37830</b></p>  | <p>4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION</p> <p><b>Steven Read</b></p> <p>TELEPHONE NUMBER</p> <p style="text-align: center;"><b>(865) 963-2980</b></p>                      |

SUBMIT ITEMS 5 THROUGH 11 ON 8-1/2 X 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.

|   |  |              |                 |    |
|---|--|--------------|-----------------|----|
| <p>5. RADIOACTIVE MATERIAL<br/>a. Element and mass number; b. chemical and/or physical form; and c. maximum amount which will be possessed at any one time.</p> | <p>6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.</p>   |              |                 |    |
| <p>7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING EXPERIENCE.</p>   | <p>8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.</p>   |              |                 |    |
| <p>9. FACILITIES AND EQUIPMENT.</p>   | <p>10. RADIATION SAFETY PROGRAM.</p>   |              |                 |    |
| <p>11. WASTE MANAGEMENT.</p>  | <p>12. LICENSE FEES (See 10 CFR 170 and Section 170.31)</p> <table style="width:100%; border: none;"> <tr> <td style="border: none;">FEE CATEGORY</td> <td style="border: none;">AMOUNT ENCLOSED</td> <td style="border: none;">\$</td> </tr> </table> | FEE CATEGORY | AMOUNT ENCLOSED | \$ |
| FEE CATEGORY  | AMOUNT ENCLOSED  | \$           |                 |    |

13. CERTIFICATION. (Must be completed by applicant) THE APPLICANT UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BINDING UPON THE APPLICANT.

THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT, NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PARTS 30, 32, 33, 34, 35, 36, 39, AND 40, AND THAT ALL INFORMATION CONTAINED HEREIN IS TRUE AND CORRECT TO THE BEST OF THEIR KNOWLEDGE AND BELIEF.

WARNING: 18 U.S.C. SECTION 1001 ACT OF JUNE 25, 1948 62 STAT. 749 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

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|--|------------------|--|
| <p>CERTIFYING OFFICER -- TYPED/PRINTED NAME AND TITLE</p> <p><b>JUERGEN STEIN, GENERAL MANAGER</b></p> | <p>SIGNATURE</p> | <p>DATE</p> <p style="text-align: center;"><b>03/29/2011</b></p> |
|--|------------------|--|

| FOR NRC USE ONLY |         |              |                 |              |          |
|------------------|---------|--------------|-----------------|--------------|----------|
| TYPE OF FEE      | FEE LOG | FEE CATEGORY | AMOUNT RECEIVED | CHECK NUMBER | COMMENTS |
|                  |         |              | \$              |              |          |
| APPROVED BY      |         |              |                 | DATE         |          |



FLIR Radiation, Inc.  
100 Midland Road  
Oak Ridge, TN 37830  
Tel.: (865) 220 8700 ext.101  
Fax: (865) 220 7181

License Number 41-25639-01E

Jack Foster  
Chief Licensing Branch  
State Agreements & Industrial Safety Branch  
Division of Materials Safety and State Agreements  
Office of federal and State Materials and  
Environmental Management Programs  
U.S. NRC  
Washington, D.C. 20555-0001

Dated: March 29<sup>th</sup>, 2011

**Reference request for incorporating an exempt source into a product for internal calibration purposes in accordance with § 32.14 and § 30.15 (a) (9):**

Attention: Mr. Jack Foster

Dear Mr. Foster

FLIR Radiation, Inc. would like to expand its operations here in the U.S. by manufacturing and distributing handheld gamma spectrometers with scintillation detectors. Each of these products would require either a 3 nanoCurie or 15 nanoCurie Cesium-137 sealed source for internal calibration purposes. We are therefore requesting that FLIR Radiation, Inc. be authorized to incorporate an exempt sealed Cesium-137 source, not to exceed 15 nanoCuries, for purposes of internal calibration, into the under mentioned products:

- identiFINDER
- radHUNTER

Not more than one Cesium-137 source would be incorporated into each product.

We are also requesting that FLIR Radiation, Inc. be authorized to distribute these products in accordance with § 30.15 (a) (9).

As each source would not contain more than one exempt quantity set forth in § 30.71, Schedule B and each instrument would only contain one exempt quantity, we would be in full compliance with § 30.15 (a) (9) (i) and § 30.15 (a) (9) (ii).

**DESCRIPTION OF PRODUCTS:**

The identiFINDER and radHUNTER instruments are a family of hand-held, digital gamma spectrometers.

Each handheld is able to rapidly locate, accurately measure and precisely identify sources or contaminations from gamma radiation. The instruments also have the ability to detect X-ray sources as well as the presence of neutrons in the radiation field via an optional neutron detector. The scintillation detector used in each of these products is either a NaI(Tl) or LaBr<sub>3</sub> (Ce<sup>3+</sup>), depending upon the model. We are also looking into other variations of scintillation detectors available.

The Cesium-137 source would be used for purposes of internal calibration and peak stabilization. The internal calibration would be performed after powering up the instrument and any other time

when prompted by the user. After the instrument has performed its internal calibration, the instrument would stabilize off the Cesium-137 source. By incorporating an extremely low activity exempt Cesium-137 source into the product enables accurate peak stabilization regardless of change of environmental conditions. Therefore the instrument can be used immediately to search, locate and identify gamma sources with precise accuracy.

The under mentioned drawings of the instruments are attached.

- For the identiFINDER family of products, drawing number "identiFINDER Series NRC".
- For the radHUNTER family of products, drawing number "radHUNTER A2 NRC".

**SEALED CESIUM-137 SOURCE:**

|                                |                           |
|--------------------------------|---------------------------|
| Isotope:                       | Cesium-137                |
| Nominal activity:              | 3nanoCurie or 15nanoCurie |
| Chemical and/or Physical Form: | Cesium Chloride           |
| Encapsulation:                 | Laminated                 |

The Cesium-137 sources are manufactured by Spectrum Techniques, Inc. A copy of the U.S. NRC license from Spectrum Techniques, Inc. is attached (License number 41-23845-01E).

Sources are wipe/leak tested by Spectrum Techniques, Inc. A certificate of compliance is provided with each source which remains with the product when shipped. A sample of the "Certificate of Compliance" is attached.

Spectrum Techniques, Inc. provides a U.S. NRC, DOT and IATA brochure which includes information set forth under § 32.19. A copy is attached. A copy of the brochure will be shipped with the product.

**DETAILS OF CONSTRUCTION:**

The sealed Cesium-137 exempt source would be attached to the end of the scintillation detector by double sided adhesive tape. The tape has a strong adhesive that can withstand environmental conditions beyond the products operating range. The housing is constructed from aluminum to prevent any damage to the internal components including Cesium-137 source. A piece of Boron or similar material will be placed between the Cesium-137 source and end cap. Although highly unlikely, should the Cesium-137 source become detached from the detector, the Boron padding would hold the source in place.

For further details, the under mentioned work instructions on how to incorporate the source into the product are attached.

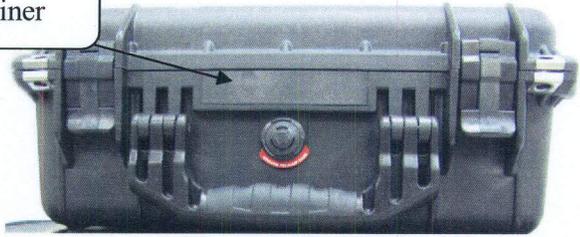
- For the identiFINDER family of products, work instruction number "wi-5009-identifinder cs-137 source assembly".
- For the radHUNTER family of products, work instruction number "wi-5010-radhunter cs-137 source assembly".

**LABELING:**

In accordance with §32.14(b) (6), I am proposing that each instrument and its container have a durable, legible, readily visible label that contains the following information:

- Identification of our company, "FLIR Radiation, Inc."
- Statement, "CONTAINS RADIOACTIVE MATERIAL"
- Name of the radionuclide, "Cs-137"
- Quantity of activity, "3nCi or 15nCi"

Positioning of label  
on the container

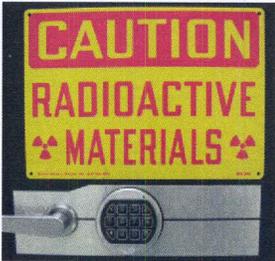


Refer to the under mentioned drawings for the positioning of the label on the products;

- For the identiFINDER family of products, drawing number "identiFINDER Series NRC".
- For the radHUNTER family of products, drawing number "radHUNTER A2 NRC".

**FACILITIES AND EQUIPMENT:**

All exempt sources are to be stored in a locked steel safe. This is the same safe where other exempt source kits are stored for distribution under our present license (§ 32.18 and § 30.18). The safe is clearly marked with a "CAUTION RADIOACTIVE MATERIALS" sign. The safe is secured by a lock.



The safe is located in the manufacturing radioactive materials storage facility in the manufacturing area. This radioactive materials storage facility is secured by a lock. There are also clearly marked signs on the door, "CAUTION RADIOACTIVE MATERIALS" and "PERSONNEL MONITORS REQUIRED BEYOND THIS POINT"



Access to the radioactive materials storage facility and safe is restricted to trained and monitored personnel. The area will be surveyed using a calibrated survey meter to ensure that the dose rate is less than 2 millirem per hour at 30cm from the safe walls. If necessary, lead shielding will be added to supplement the shielding properties of the steel safe. Although due to the activity of the sources and the amount of time these sources would remain in storage, this is very unlikely going to be necessary.

The manufacturing area is also a controlled, restricted area. Before sources are removed from the radioactive materials storage facility, "CAUTION RADIOACTIVE MATERIALS" and "PERSONNEL MONITORS REQUIRED BEYOND THIS POINT" signs are posted on the doors to the manufacturing area.

All radioactive materials that are not in use will be stored in the safe.

NRC form 3, "Notice to Employees," is prominently displayed in the radioactive materials storage facility area.

A building plan is attached. The manufacturing area has been highlighted.

**STORAGE OF PRODUCTS:**

The products shall be stored in a secure location until transferred under § 30.15 (a) (9).

It is estimated that the typical time interval between introduction of the source and transfer of the product to be 4-6 weeks.

**DISPOSAL OF SOURCES:**

Should it be necessary to dispose of exempt quantities, the sources will be returned to the manufacturer.

**PERSONNEL DOSIMETRY:**

All personnel working with or in the proximity of radioactive sources shall wear a Thermoluminescent dosimeter (TLD) or other monitoring device that is capable of measuring cumulative exposure to ionizing radiation.

**SHIPPING OF INSTRUMENTS WITH EXEMPT SOURCES:**

No more than 10 exempt quantities set forth in § 30.71, Schedule B will be sold or transferred in any single transaction. For purposes of this requirement, an individual exempt quantity may be composed of fractional parts of one or more of the exempt quantities in § 30.71, Schedule B, but the sum of such fractions will not exceed unity.

Each instrument would be individually packaged in a durable case. The outer package would be such that the dose rate at the external surface of the package would not exceed 0.5 millirem per hour. This would be verified with a calibrated survey meter. The survey would be conducted by trained personnel in our shipping department. Training would also include use of the applicable survey meter.

The instrument and its container would have a durable, legible, readily visible label that contains the following information:

- Identification of our company, "FLIR Radiation, Inc."
- Statement, "CONTAINS RADIOACTIVE MATERIAL"
- Name of the radionuclide, "Cs-137"
- Quantity of activity, "3nCi or 15nCi"

An accompanying brochure provided by Spectrum Techniques, Inc., shall include the following information:

- State that the contents are exempt from NRC or Agreement State licensing requirements;
- Bear the words "Radioactive Material--Not for Human Use--Introduction Into Foods, Beverages, Cosmetics, Drugs, or Medicinals, or Into Products Manufactured for Commercial Distribution is Prohibited -- Exempt Quantities Should Not be Combined";
- Additional radiation safety precautions and instructions relating to the handling, use, storage, and disposal of the radioactive material.

### **QUALITY ASSURANCE AND CONTROL:**

FLIR Radiation, Inc. maintains a quality assurance program which has been approved by the State of Tennessee. License number R-01097-B14. A copy is available upon request. FLIR Radiation, Inc. is also ISO certified 9001: 2008.

To satisfy the requirements of § 32.14(b)(4), FLIR Radiation, Inc. performed drop testing on the prototype radHUNTER and identiFINDER at Global Testing Laboratories, Knoxville, Tennessee. This test was to demonstrate that even under the most severe conditions likely to be encountered in normal use of the product the source will not be damaged or released to the environment. Detailed reports from Global Testing Laboratories are attached (Report reference numbers are G1102023 and G1102016).

Although the design of the housing prevents any damage to the source, even under the most severe conditions likely to be encountered in normal use of the product, wipe tests were performed to verify that the sources were not damaged. The leak tests were performed by Atomic Energy Industrial Laboratories. The results are attached.

In accordance with our ISO program, all products must be quality inspected prior shipment, which includes a visual inspection. Any product that shows any signs of damage will not be shipped in accordance with our ISO program. To satisfy § 32.15 (a) (3), the following instruction will be added as a section to our final quality control procedure;

“Visually inspect instrument. If the instrument has an observable physical defect that could affect containment of the Cs-137 source, the instrument must be considered as a defective unit. If an instrument is considered to be a defective unit, then the instrument will not be transferred to other persons for use under § 30.15. Damaged parts must be replaced and a further quality control must be performed before instrument can be transferred.”

As part of our ISO program, products that show even minor signs of damage will not be shipped before the issue has been resolved.

### **EVALUATION OF POTENTIAL RADIATION EXPOSURE:**

#### **Measurements:**

All measurements were taken with a calibrated Micro-R Ludlum model 19 survey meter serial number 265219. This survey meter was calibrated on the 10<sup>th</sup> September, 2010. Certificate of calibration is attached. All testing was done in a lead chamber lined with tin and copper. The measured background in the lead chamber was between 1-2 micro R/hr. The background was subtracted from the results recorded.



Test 1 – Dose equivalent at center point of the identiFINDER end cap (closet point to source):

- A 15nCi, Cesium-137 source was attached to the identiFINDER detector in accordance with work instruction number “wi-5009-identifinder cs-137 source assembly”.
- The Micro-R meter (marking on instrument to indicate center point of detection) was placed flush against the detector end cap (center point of Cesium-137 source) for an accurate reading. The reading from the Micro-R meter was recorded in the chart below this section.

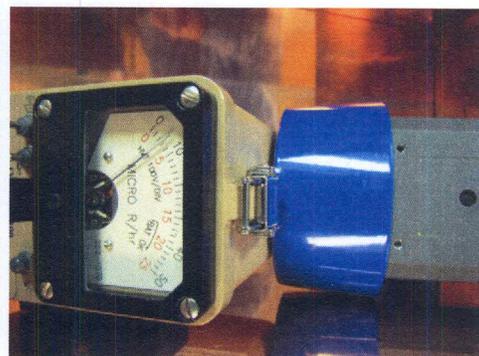


- This test was performed again with 4 other samples of 15nCi, Cesium-137 source. Readings were recorded in the chart below this section.
- This same test was then performed with 5 samples of 3nCi, Cesium source. Readings were recorded in the chart below.

| identiFINDER family   |                   |          |          |          |          |
|-----------------------|-------------------|----------|----------|----------|----------|
| Source Sample Numbers | Source 1          | Source 2 | Source 3 | Source 4 | Source 5 |
| Activity (nCi)        | Dose Rate (µR/hr) |          |          |          |          |
| 3                     | 0                 | 0        | 0        | 0        | 0        |
| 15                    | 3                 | 4        | 5        | 3        | 4        |

Test 2 – Dose equivalent at center point of the radHUNTER end cap (closet point to source):

- A 15nCi, Cesium-137 source was attached to the radHUNTER detector in accordance with work instruction number wi-5010-radhunter cs-137 source assembly.
- The Micro-R meter (marking on instrument to indicate center point of detection) was placed flush against the detector end cap (center point of Cesium-137 source) for an accurate reading. The reading from the Micro-R meter was recorded in the chart below this section.



- This test was performed again with 4 other samples of 15nCi, Cesium-137 source. Readings were recorded in the chart below this section.
- This same test was then performed with 5 samples of 3nCi, Cesium source. Readings were recorded in the chart below.

| radHUNTER family      |                   |          |          |          |          |
|-----------------------|-------------------|----------|----------|----------|----------|
| Source Sample Numbers | Source 1          | Source 2 | Source 3 | Source 4 | Source 5 |
| Activity (nCi)        | Dose Rate (µR/hr) |          |          |          |          |
| 3                     | 0                 | 0        | 0        | 0        | 0        |
| 15                    | 2                 | 3        | 3        | 2        | 3        |

**Theoretical calculations:**

Dose Rate Estimation Method

Software: MCNP5 version 1.51

Method: Flux-to-dose rate conversion factors from ICRP-21 (Appendix H2 of MCNP5 Manual Vol.2)

Description:

A model generated within MCNP5 is defined such that the areas of greatest contribution to the dose rate absorbed by a user are included. These areas are the detector end cap surface, detector end cap walls and at 1 foot from the face of the detector above the source. Areas behind the source are neglected as the detector shields the source. The source is modeled as the sum of 3 specific energies: the 661.6keV with an intensity of 0.851, the 32keV X-ray with an intensity of 0.055, and a 514keV beta with an intensity of 0.941. Physics models include photon and electron physics, such that the dose contribution from the beta particle is in terms of bremsstrahlung production rather than creating a virtual detector.

CEA tables 2006: [http://www.nucleide.org/DDEP\\_WG/Nuclides/Cs-137\\_tables.pdf](http://www.nucleide.org/DDEP_WG/Nuclides/Cs-137_tables.pdf)

| identiFINDER family |                     |    |
|---------------------|---------------------|----|
|                     | Dose Rate (µrem/hr) |    |
| Activity (nCi)      | 3                   | 15 |
| 1 ft                | 0                   | 0  |

| radHUNTER family |                     |    |
|------------------|---------------------|----|
|                  | Dose Rate (µrem/hr) |    |
| Activity (nCi)   | 3                   | 15 |
| 1 ft             | 0                   | 0  |

**Summary:**

The radHUNTER and identiFINDER products are designed so that when is use the intrinsic source is usually at least 1 foot away from the person handling the product. The hand holding the product would be approximately 6 inches from the source, but the detector, housing and electronics would provide shielding to prevent any dose to the hands. At a distance of 1 foot from the source the effective dose is 0micro rem/hr.

By incorporating a 3-15nCi, Cs-137 source into the product eliminates the necessity of having to handle a 1µCi, Cs-137, thus significantly reducing any potential radiation exposure from ionizing radiation. The built-in Cesium-137 source also significantly improves the performance of the products.

**END USER LICENSING REQUIREMENT:**

As the identiFINDER and radHUNTER are ionizing radiation measuring instruments, and the source would be used for purposes of internal calibration § 30.15 (9), and the source contains not more than one exempt quantity set forth in § 30.71, Schedule B, and each instrument would not contain more than 1 exempt quantity, then in accordance with §30.15 (a) any person other than the manufacturer and initial distributor, would be exempt from the requirements of a license.

**TRAINING:**

Training in radiation protection shall be provided to Authorized Users who are not otherwise qualified by previous training and experience. Authorized User Training provides specific knowledge of radiation protection for the activities authorized by the site Radioactive Material License. Authorized User Training will undergo formal classroom training in the following topics:

- Radioactivity and radioactive decay
- Characteristics of ionizing radiation
- Man-made radiation sources
- Acute effects of exposure to radiation
- Risks associated with occupational radiation exposures
- Special considerations in the exposure of declared pregnant women
- Dose equivalent limits
- Modes of exposure (internal and external)
- Basic protection measures (time, distance, shielding)
- Radiation survey instrumentation, calibration, and limitations
- Emergency procedures
- Warning signs, labels, barriers, and alarms
- Responsibilities of employees and management
- Interactions with the RSO

Refresher training for all training categories is conducted whenever major changes are made in the Radiation Protection Program, regulations that affect the radiation protection aspects of the work, or when assigned to a new job with different radiological concerns. Refresher training would be completed minimum once every year.

All personnel that work with or in the proximity of radioactive material would undergo training.

Personnel in shipping and receiving, undergo additional training which includes IATA, DOT and survey instrumentation.

Training records are maintained as quality records.

**ROCORD AND REPORTS OF TRANSFER:**

In accordance with § 32.16, FLIR Radiation, Inc. will maintain records of transfer of radioactive material. The records will identify, by name and address, each person to whom radioactive material was transferred. We will file a report file with the Director of the Office of Federal and State Materials and Environmental Management Programs, attention: Document Control Desk/Exempt Distribution by no later than January 31 of each year. This report will include the information as specified in § 32.16.

**SUMMARY OF ATTACHMENTS:**

- Drawing number, identiFINDER Series NRC.
- Drawing number, radHUNTER A2 NRC.
- Copy of the U.S. NRC license from Spectrum Techniques, Inc., license number 41-23845-01E.
- Sample of the Certificate of Compliance.
- U.S. NRC, DOT and IATA brochure.
- Work instruction number wi-5009-identifinder cs-137 source assembly.
- Work instruction number wi-5010-radhunter cs-137 source assembly.
- Building plan, drawing number A100.
- Global testing Laboratories report reference number G1102023.
- Global testing Laboratories report reference number G1102016.
- Atomic Energy Industrial Laboratories Certificate of Leak Tests for the identiFINDER product.
- Atomic Energy Industrial Laboratories Certificate of Leak Tests for the radHUNTER product.
- ICx Radiation, Inc. organizational chart.
- Certificate of Calibration for Micro-R Ludlum model 19 survey meter serial number 265219.
- NRC FORM 313 Application for materials license.

I hope that we have provided you with adequate information. However, should you need any further information to assist in your review, please do not hesitate to contact me.

Yours sincerely,



Steven Read  
RSO

CC Juergen Stein (General Manager)