

# VIRGIN ISLANDS PAVING, INC.

PO Box 4720, Kingshill, VI 00851-4720  
TEL (340) 778-5220 FAX (340) 773-5233

February 14, 2013

Licensing Assistance Team  
Division of Nuclear Materials Safety  
US Nuclear Regulatory Commission, Region 1  
2100 Renaissance Boulevard, Suite 100  
King of Prussia, PA 19406-2713

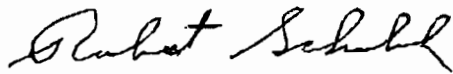
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03036264

Re: Renewal of Material License  
Control Number: 579815

Dear Sir or Madam:

Virgin Islands Paving, Inc. currently has a material license. (55-25624-01) We are in need of renewing this license for future projects. Thank you in advance for your cooperation.

Sincerely,



Robert J. Schierloh  
President

REC'D IN LAT 2-15-13

579815  
NMSS/RGN1 MATERIALS-002

NRC FORM 313  
(05-2012)  
10 CFR 30, 32, 33,  
34, 35, 36, 39, and 40

U.S. NUCLEAR REGULATORY COMMISSION

APPLICATION FOR MATERIALS LICENSE

APPROVED BY OMB: NO. 3160-0120

EXPIRES: (05/31/2016)

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 Information Services Branch (T-5 F63), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by Internet e-mail to [InfoCollects.Resource@nrc.gov](mailto:InfoCollects.Resource@nrc.gov), and to the Desk Officer, Office of Information and Regulatory Affairs, NEOP-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.

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.

APPLICATION FOR DISTRIBUTION OF EXEMPT PRODUCTS FILE APPLICATIONS WITH:

OFFICE OF FEDERAL & STATE MATERIALS AND  
ENVIRONMENTAL MANAGEMENT PROGRAMS  
DIVISION OF MATERIALS SAFETY AND STATE AGREEMENTS  
U.S. NUCLEAR REGULATORY COMMISSION  
WASHINGTON, DC 20555-0001

ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS:

IF YOU ARE LOCATED IN:

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:

LICENSING ASSISTANCE TEAM  
DIVISION OF NUCLEAR MATERIALS SAFETY  
U.S. NUCLEAR REGULATORY COMMISSION, REGION I  
2100 RENAISSANCE BOULEVARD, SUITE 100  
KING OF PRUSSIA, PA 19406-2713

IF YOU ARE LOCATED IN:

ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR WISCONSIN,  
SEND APPLICATIONS TO:

MATERIALS LICENSING BRANCH  
U.S. NUCLEAR REGULATORY COMMISSION, REGION III  
2443 WARRENVILLE ROAD, SUITE 210  
Lisle, IL 60532-4932

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:

NUCLEAR MATERIALS LICENSING BRANCH  
U.S. NUCLEAR REGULATORY COMMISSION, REGION IV  
1600 E. LAMAR BOULEVARD  
ARLINGTON, TX 76011-4511

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.

1. THIS IS AN APPLICATION FOR (Check appropriate item)

- ☐ A. NEW LICENSE  
☐ B. AMENDMENT TO LICENSE NUMBER  
☒ C. RENEWAL OF LICENSE NUMBER

55-25624-01

2. NAME AND MAILING ADDRESS OF APPLICANT (Include ZIP code)

Virgin Islands Paving, Inc.  
PO Box 4720  
Kingshill, VI 00851

3. ADDRESS WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED

Virgin Islands Paving, Inc.  
13 GA Estate Bethlehem  
St. Croix, VI 00850

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

Bryan Farley

BUSINESS TELEPHONE NUMBER  
(340) 778-5220

BUSINESS CELLULAR TELEPHONE NUMBER  
(340) 277-5567

BUSINESS EMAIL ADDRESS  
[bfarley@vipaving.com](mailto:bfarley@vipaving.com)

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.

5. RADIOACTIVE MATERIAL

a. Element and mass number; b. chemical and/or physical form; and c. maximum amount which will be possessed at any one time.

6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.

7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING EXPERIENCE.

8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.

9. FACILITIES AND EQUIPMENT.

10. RADIATION SAFETY PROGRAM.

11. WASTE MANAGEMENT.

12. LICENSE FEES (See 10 CFR 170 and Section 170.31)

FEE CATEGORY 3P AMOUNT ENCLOSURE \$ 0.00

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 20, 32, 33, 34, 35, 36, 38, 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.

CERTIFYING OFFICER - TYPED/PRINTED NAME AND TITLE

SIGNATURE

DATE

Robert J. Schierloh - President



2/15/13

FOR NRC USE ONLY

TYPE OF FEE FEE LOG FEE CATEGORY AMOUNT RECEIVED CHECK NUMBER COMMENTS

\$

APPROVED BY

DATE

5a Element and mass number	5b Chemical and/or physical form	5c Maximum amount that will be possessed at one time
A Cesium-137	Sealed source Troxler Drawing 102112	No single source to exceed 9 mCi
B Americium-241	Sealed source Troxler Drawing 102451	No single source to exceed 44 mCi

**6. Purpose for Which Licensed Materials Will Be Used:**

**To be used in Troxler 3400 series gauges and CPN AC2 series gauges for measurement of physical properties of materials.**

## Gauge Inventory

**#1**

Man: Troxler  
 Model: 3430  
 Gauge Serial #: 20404  
 SS&D Reg: NC-646-D-130-S

License #: 55-25624-01  
 Company: Virgin Islands Paving, Inc.  
 Address: 13 GA Estate Bethlehem  
 East Airport Road  
 St. Croix, VI 00850

Radionuclide	Activity	Serial #	Certification Date	Assay Date	Leak Test Date	Troxler Drawing	Spec Form Certificate	ANSI Class
AM-241:BE	1.480 GBq	47-15882	2/15/91	2/15/91	12/26/91	102451	USA/0632/S	C66545
CS-137	0.300 GBq	75-1757	6/20/91	6/20/91	12/26/91	102112	USA/0614/S	C64444

**#2**

Man: Troxler  
 Model: 3440  
 Gauge Serial #: 24458  
 SS&D Reg: NC-646-D-130-S

License #: 55-25624-01  
 Company: Virgin Islands Paving, Inc.  
 Address: 13 GA Estate Bethlehem  
 East Airport Road  
 St. Croix, VI 00850

Radionuclide	Activity	Serial #	Certification Date	Assay Date	Leak Test Date	Troxler Drawing	Spec Form Certificate	ANSI Class
AM-241:BE	1.480 GBq	47-20508	12/19/94	12/19/94	5/14/03	102451	USA/0632/S	C66545
CS-137	0.300 GBq	75-6508	1/13/95	1/13/95	5/14/03	102112	USA/0614/S	C64444

**#3**

Man: CPN  
 Model: AC-2R  
 Serial #: A220801043

License #: 55-25624-01  
 Company: Virgin Islands Paving, Inc.  
 Address: 13 GA Estate Bethlehem  
 East Airport Road  
 St. Croix, VI 00850

Radionuclide	Activity	Leak Test Date	Spec Form Certificate
Am-241:Be	100 mCi	6/21/2010	CZ/1009/S-96

**7. Bryan Farley will be the designated RSO for Virgin Islands Paving Inc. He has completed Troxler's Nuclear Gauge Safety Training Class and has completed Troxler's Radiation Safety Officer Training Class.**

## **APPENDIX D**

### **RSO RESPONSIBILITIES**

The RSO is responsible for ensuring the following:

- ♦ Stopping licensed activities that the RSO considers unsafe.
- ♦ Possession, use, storage, and maintenance of sources and gauges are consistent with the limitations of the license, the Sealed Source and Device Registration sheet(s), and manufacturer's recommendations and instructions.
- ♦ Individuals using gauges are properly trained.
- ♦ When necessary, personnel monitoring devices are used and exchanged at the proper intervals; records of the results of such monitoring are maintained.
- ♦ Gauges are properly secured.
- ♦ Proper authorities are notified in case of accident, damage to gauges, fire, or theft.
- ♦ Unusual occurrences involving the gauge (e.g., accident, damage) are investigated, causes(s) and appropriate corrective action are identified, and corrective action is taken.
- ♦ Audits are performed at least annually and documented, and corrective actions taken.
- ♦ Licensed material is transported in accordance with all applicable DOT requirements.
- ♦ Licensed material is disposed of properly.
- ♦ Appropriate records are maintained.
- ♦ Up-to-date license is maintained and amendment and renewal requests submitted in a timely manner.

Reference: NUREG-1556, Vol. 1

**8. Before using licensed materials, all gauge users will have successfully completed the Troxler Nuclear Gauge Safety Training Class.**



**9. Nuclear gauges will be stored under lock and key in the Quality Control Lab at one of the following locations for Virgin Islands Paving Inc:**

**Virgin Islands Paving, Inc.  
13 GA Estate Bethlehem  
St. Croix, VI 00850**

**Virgin Islands Paving, Inc.  
149B Subbase  
St. Thomas, VI 00802**

## **10. Radiation Safety Program**

# **Virgin Islands Paving, Inc.**

## **Radiation Safety Program**

### **A. Personnel Monitoring**

All personnel will wear a personnel monitoring device, such as a TDL badge, to measure radiation exposure when using or transporting gauges. The badges shall be exchanged at intervals not to exceed 3 months. Dosimetry badges shall be provided by a vendor accredited by the National Voluntary Laboratory Accreditation Program (NVLAP), such as Troxler Electronic Laboratories, Inc.

Troxler Radiation Monitoring Services  
3008 Cornwallis Road  
Research Triangle Park, NC 27709

### **B. Radiation Detection Instruments**

We will maintain a survey meter for the use in the event of an incident involving the gauge. The survey meter will be calibrated annually by the manufacturer or other vendor and checked for functionality before use.

Survey meter in use will be:

Manufacturer: SE International, Inc  
Model: Radiation Alert 4  
Type: G-M survey meter  
Radiation detected: Alpha, Beta, Gamma, and X-ray  
Window thickness: 1.5 mg/cm<sup>2</sup>

Survey meter will be calibrated by:

Troxler Electronic Laboratories, Inc.  
30008 Cornwallis Road  
Research Triangle Park, NC 27709

### **C. Sealed Source Leak Testing**

Leak testing will be performed at intervals not to exceed 6 months or other intervals specified in the license. Leak test samples will be analyzed by an organization authorized by the NRC or Agreement State to provide leak test services, such as Troxler Electronic Laboratories, Inc. (North Carolina license No. 031-0182-1)

### **D. Material Receipt and Accountability**

Records of receipt, transfer, and disposal of gauges will be maintained for at least 3 years.

Physical inventories of sealed sources will be conducted at intervals no to exceed 6 months.

## APPENDIX E

### GAUGE UTILIZATION LOG

Manufacturer: \_\_\_\_\_ Model: \_\_\_\_\_ Serial #: \_\_\_\_\_  
Radionuclide(s) \_\_\_\_\_ Activity \_\_\_\_\_

[illegible]

## APPENDIX F

# SEALED SOURCE PHYSICAL INVENTORY LOG

[illegible]

**Performed by:** \_\_\_\_\_ **Date:** \_\_\_\_\_

## Trouder Licensing Guide

**F-1**

#### **E. Public Dose**

**Gauges will be used, transported, and stored in such a way that no member of the public receives a dose of more than 100 mrem in one year.**

**Dose in unrestricted areas will not exceed 2 mrem in any one hour.**

**Will control and maintain constant surveillance over gauges that are not in storage and secure gauges from unauthorized use or removal.**

## APPENDIX G PUBLIC DOSE CALCULATION WORKSHEET

To demonstrate compliance, you must show that the maximum dose to any *member of the public* will be less 100 millirem in a year and that the maximum dose in any *unrestricted area* will be less than 2 millirem in any *one hour*. The typical limiting case involves the storage of gauges. Several simplifying and conservative assumptions are made in this calculation method:

- No shielding other than the shielding in the gauge is assumed to be present.
- All gauges are assumed to be at the same distance as the closest gauge.
- Sources are assumed to remain in the shielded position within the gauge.
- Each gauge is assumed to be a point source and dose rates are assumed to decrease with the inverse square of distance from the gauge.
- Gauges are assumed to be in storage all of the time.

More realistic assumptions can be made or actual measured dose rates can be used if necessary to demonstrate compliance.

Step	Instruction	Result
<b>DOSE TO MEMBER OF PUBLIC IN ONE YEAR</b>		
1	Identify the individual member of the public likely to receive the highest dose from gauges in storage. This will be the person who spends the most time in the vicinity of the stored gauges or who is closest to the gauges. This individual will be the focus of the calculation.	
2	Determine the maximum dose rate in mrem/hr at a distance of three feet (1 meter) for each gauge kept in the storage location. This value may be obtained from the radiation profile in the gauge operation manual, from the manufacturer, or from Transport Index on the Yellow II label on the transport case. Calculate the sum of the dose rate values for all of the gauges that may be stored at this location and enter the result. Remember to include both gamma and neutron dose.	
3	Enter the distance in feet from the position occupied by the person identified in step 1 to the nearest gauge in the storage area.	
4	Calculate the square of the distance from step 3 and enter the result.	
5	Divide the value from step 4 by 9 and enter the result. This is a factor that accounts for the difference between the dose rate at 3 feet and the dose rate at the distance at which the person is located.	
6	Divide the dose rate (mrem/hr) from step 2 by the result from step 5 and enter the result.	
7	Enter the number of hours in a year that the individual will be present in the vicinity of the gauges. For example, an individual working full-time near the gauges, would be present approximately 2000 hrs in a year (8 hrs per day x 5 days per week x 50 weeks per year).	
8	Multiply the result from step 6 by the result from step 7 and enter the result. This is the maximum dose in mrem the individual could receive in one calendar year. If this value is less than 100 mrem, the annual dose limit is met; otherwise with step 9 to determine if the unrestricted area dose rate limit is met.	



DOSE IN UNRESTRICTED AREAS IN ONE HOUR		
9	Determine the minimum distance in feet to any unrestricted area outside the gauge storage area and record the value. This could be an area above, below, or adjacent to the storage area that is unrestricted for the purpose of radiation control. The area need not be occupied, just accessible to members of the public, which may include company employees.	
10	Calculate the square of the distance from step 9 and enter the result.	
11	Divide the value from step 10 by 9 and enter the result. This is a factor that accounts for the difference between the dose rate at 3 feet and the dose rate at the distance in step 9.	
12	Divide the dose rate (mrem/hr) from step 2 by the result from step 11 and enter the result. This is the maximum dose in mrem that could be received in one hour in the closest unrestricted area. If this value is less than 2 mrem, the dose limit for unrestricted areas is met.	
Calculations performed by		Date

If either dose limit is exceeded, you should either recalculate that dose using more realistic assumptions and data or take steps to reduce the dose received by members of the public using the principles of time, distance, and shielding.

- ♦ Limit the time personnel spend in the vicinity of the gauges
- ♦ Increase the distance between the gauges and personnel
- ♦ Add shielding to reduce the dose rate

## OCCUPANCY FACTORS

The following occupancy data may be used when data for specific personnel are not available:

Area	Occupancy Factor (T)
Work areas such as offices, laboratories, shops, wards, nurses' stations; living quarters; children's play areas; and occupied space in nearby buildings.	Full Occupancy (T=1)
Corridors, rest rooms, elevators using operators, unattended parking lots.	Partial Occupancy (T=1/4)
Waiting rooms, toilets, stairways, unattended elevators, janitor's closets, outside areas used only for pedestrians or vehicular traffic.	Occasional Occupancy (T=1/16)

Reference: NCRP Report No. 49, *Structural Shielding Design and Evaluation for Medical Use of X-Rays and Gamma Rays of Energies Up to 10 MeV*, 1976

## SHIELDING HALF-VALUES\*

Material	Cs-137 Gamma Radiation	Am-241 Neutron Radiation
Lead	1/4 in.	N/A
Concrete	2 in.	4 in.

\* The half-value is the thickness of material that will reduce the dose rate by one-half.

## **F. Operating and Emergency Procedures**

## **APPENDIX H**

### **OPERATING AND EMERGENCY PROCEDURES**

#### **OPERATING PROCEDURES**

1. Always wear assigned personnel dosimetry devices (e.g., TLD badge) when using or transporting the gauge.
2. Never wear another person's dosimeter.
3. Never store a dosimeter near the gauge or other radiation source.
4. Before removing the gauge from its place of storage, ensure that in gauges with movable source rods, the rod is locked in the shielded position, and the transport case is locked.
5. Sign out the gauge in a logbook, stating the date(s) of use, name(s) of authorized user(s) who will be responsible for the gauge, and the temporary job site(s) where the gauge will be used.
6. Block and brace the gauge to prevent movement during transport and lock the gauge in or to the vehicle. Follow all Department of Transportation requirements when transporting the gauge.
7. Use the gauge according to the manufacturer's instructions and recommendations.
8. Do not touch the end of the source rod with your fingers, hands, or any part of your body or place any part of the body in the radiation field of the unshielded source.
9. Unless absolutely necessary, do not look under the gauge when the source rod is being lowered into the ground. If you must look under the gauge to align the source rod with hole, keep all body parts as far from the unshielded source as possible to minimize radiation exposure.
10. After completing each measurement in which the source is unshielded, immediately return the source to the shielded position.
11. Always maintain constant surveillance and immediate control of the gauge when it is not in storage or secured in the transport vehicle. Never leave the gauge unattended. Protect the gauge and yourself from danger of moving heavy equipment.
12. Always keep unauthorized persons away from the area where the gauge is being used.
13. Perform routine cleaning and maintenance according to the manufacturer's instructions and recommendations.
14. When the gauge is not in use at a temporary job site, place the gauge in a secured storage location (e.g., locked in the trunk of a car or locked in a storage shed).
15. Prior to transporting the gauge, ensure that each gauge source is in the fully shielded position. Ensure that the source rod is locked in the shielded position and that the gauge is placed into the case and lock the case. Block and brace the gauge to prevent movement during transportation. Lock the case in or to the vehicle.
16. Return the gauge to its proper storage location at the end of the work shift.
17. Log the gauge into the daily use log when it is returned to storage.

18. If gauges are used for measurements with the unshielded source extended more than 3 feet below the surface, use piping, tubing or other casing material to line the hole from the lowest depth to 12 inches above the surface. If the piping, tubing, or other casing material cannot extend 12 inches above the surface, cap the hole liner or take other steps to ensure that the hole is free of debris (and it is unlikely that debris will enter the cased hole), so that the unshielded source can move freely (e.g., use a dummy probe to verify that the hole is free of obstructions).
19. After making changes affecting the gauge storage area (e.g., changing the location of gauges within the area, removing shielding, adding gauges, changing the occupancy of adjacent areas, moving the storage area to a new location), reevaluate compliance with public dose limits and ensure proper security of gauges.

## EMERGENCY PROCEDURES

The following procedures apply when the source fails to return to the shielded position (e.g., as a result of being damaged, source becomes stuck below the surface) or if any other emergency or unusual situation arises (e.g., the gauge is struck by a moving vehicle or is in an accident involving a vehicle):

1. Immediately secure the area and keep people at least 15 feet away from the gauge until the situation is assessed and radiation levels are known. However, perform first aid for injured individuals and remove them from the area only when medically safe to do so.
2. If any heavy equipment is involved, detain the equipment and operator until it is determined there is no contamination present.
3. Gauge users and other potentially contaminated individuals should not leave the scene until emergency assistance arrives.
4. Visually inspect the gauge to determine the position of the source rod (exposed or shielded), and the position of the source shutter (open or closed), and the extent of damage, if any, to the source housing and/or shielding.
5. Notify the persons in the order listed below:

Name	Work Phone Number	Home Phone Number

Fill in the names and telephone numbers of appropriate personnel (e.g., the Radiation Safety Officer or other knowledgeable staff, licensee's consultant, gauge manufacturer, or regulatory agency) to be contacted in an emergency. Update list as needed.

6. Follow the directions provided by the person contacted above.
7. RSO and Licensee management must:
  - a. Arrange for a radiation survey to be conducted as soon as possible by a knowledgeable person using appropriate radiation detection instrumentation. This person could be a licensee employee or a consultant. The person must be competent in use of the survey meter.
  - b. Make necessary notifications to local authorities as well as the NRC or Agreement State licensing agency as appropriate.
  - c. Reports to the NRC or Agreement States must be made within the reporting timeframes specified in regulations. Reporting requirements are found in 10 CFR 20.2201-2203 and 10 CFR 30.50 or corresponding Agreement State regulations.

#### **NOTE**

**Before shipping a damaged gauge to Troxler, you must do the following:**

- Send close-up photographs of the damaged gauge to Troxler.
- Send a leak test sample to Troxler for analysis or send leak test results.
- Obtain a Returned Goods Authorization (RGA) number from Troxler.

# **Incident Procedures**

An accident may be defined as an event where the gauge is lost, stolen, or physically damaged to the extent that the source shielding is or could be compromised.

If the gauge is lost or stolen, follow these steps:

1. Notify the Radiation Safety Officer, Bryan Farley, at 340-277-5567 or 340-778-5220 as soon as possible. He will then immediately notify the appropriate regulatory agency (USNRC Operations Center: 301-816-5100) and the gauge manufacturer (Troxler: 919-549-9539).
2. The regulatory agency will direct the RSO as to additional agencies that must be notified.

In the event of damage at the job site:

1. Locate the source if possible.
2. Rope off the accident site and keep bystanders out of the area. A minimum distance of 15 feet from the gauge or source should be maintained.
3. If a vehicle is involved, keep it all at the site until it can be verified that it has not been contaminated.
4. Stay with the gauge but notify the RSO (Bryan Farley) as soon as possible. The RSO will notify the appropriate regulatory agency (USNRC), if necessary.
5. The RSO (Bryan Farley) or regulatory agency will determine if the gauge can be safely transported. If it is cleared, notify Troxler, obtain a RGA number, and ship by normal means. If it is not cleared, Troxler or the regulatory agency can offer further advice or assistance in making arrangements for safe shipment and disposal.

Notify the USNRC if:

1. \$25,000.00 in damage to personal property.
2. Harm to a person due to radiation.
3. If source can not be found.

**Make a report and take pictures regardless!!!**

#### **G. Maintenance**

**We will implement and maintain procedures for routine maintenance (cleaning and lubrication) of our gauges according to the manufacturer's recommendations and instructions.**

**We will send the gauges to the manufacturer to perform non-routine maintenance or repair operations that require removal of the source or source rod from the gauge.**

#### **H. Transportation**

**Gauges will be transported in compliance with DOT regulations, and Troxler Transportation Guide.**

#### **I. Audit Program**

**An audit of the radiation safety program content and implementation will be performed and documented annually. Records of audits will be maintained for at least 3 years. Corrective action will be taken promptly to prevent recurrence of deficiencies.**

# APPENDIX I PORTABLE GAUGE AUDIT CHECKLIST

## NOTE

Information in this checklist provided by the U.S. Nuclear Regulatory Commission (NRC).

## NOTE

All areas indicated in audit notes may not be applicable to every licensee and may not need to be addressed during each audit.

Licensee's name \_\_\_\_\_ License No. \_\_\_\_\_  
Auditor \_\_\_\_\_ Date of Audit \_\_\_\_\_ Telephone No. \_\_\_\_\_  
\_\_\_\_\_  
(Signature)

### 1. AUDIT HISTORY

- a. Last audit of this location conducted on (date) \_\_\_\_\_
- b. Were previous audits conducted yearly? [10 CFR 20.1101]
- c. Were records of previous audits maintained? [10 CFR 20.2102]
- d. Were any deficiencies identified during last two audits or two years, whichever is longer?
- e. Were corrective actions taken? (Look for repeated deficiencies).

### 2. ORGANIZATION AND SCOPE OF PROGRAM

- a. If the mailing address or place of use changed, was the license amended?
- b. If ownership changed or bankruptcy filed, was NRC prior consent obtained or was NRC notified?
- c. If the RSO was changed, was license amended? Does new RSO meet NRC training requirements?
- d. If the designated contact person for NRC changed, was NRC notified?
- e. Does the license authorize all of the NRC-regulated radionuclides contained in gauges possessed?
- f. Are the gauges as described in the Sealed Source and Device (SSD) Registration Certificate or Sheet? Have copies of (or access to) SSD Certificates? Have manufacturer's manuals for operation and maintenance? [10 CFR 32.210]
- g. Are the actual uses of gauges consistent with the authorized uses listed on the license?
- h. Is RSO fulfilling his/her duties?



### 3. TRAINING AND INSTRUCTIONS TO WORKERS

- a. Were all workers who are likely to exceed 100 mrem/yr instructed per [10 CFR 19.12]?  
Refresher training provided, as needed [10 CFR 19.12]?
- b. Did each gauge operator attend an approved course prior to using gauges?
- c. Are training records maintained for each gauge operator?
- d. Did interviews with operators reveal that they know the emergency procedures?
- e. Did this audit include observations of operators using the gauge in a field situation?
- f. Operating gauge? Performing routine cleaning and lubrication? Transporting gauge?  
Storing gauge?
- g. Did the operator demonstrate safe handling and security during transportation, use, and storage?
- h. HAZMAT training provided as required? [49 CFR 172.700, 49 CFR 172.701, CFR 172.702, 49 CFR 172.703, 49 CFR 172.704]

### 4. RADIATION SURVEY INSTRUMENTS

- a. If the licensee possesses its own survey meter, does it meet the criteria of the NRC?
- b. If the licensee does not possess a survey meter, are specific plans made to have one available?
- c. Is the survey meter needed for non-routine maintenance calibrated as required [10 CFR 20.1501]?
- d. Are calibration records maintained [10 CFR 20.2103(a)]?

### 5. GAUGE INVENTORY

- a. Is a record kept showing the receipt of each gauge? [10 CFR 30.51(a)(1)]
- b. Are all gauges received physically inventoried every six months?
- c. Are records of inventory results with appropriate information maintained?

### 6. PERSONNEL RADIATION PROTECTION

- a. Are ALARA considerations incorporated into the radiation protection program? [10 CFR 20.1101(b)]
- b. Is documentation kept showing that unmonitored users receive <10% of limit?
- c. Did unmonitored users' activities change during the year, which could put them over 10% of limit?
- d. If yes to c. above, was a new evaluation performed?

- e. Is external dosimetry required (user receiving >10% of limit)? In addition, is dosimetry provided to users?
  - 1. Is the dosimetry supplier NVLAP approved? [10 CFR 20.1501(c)]
  - 2. Are the dosimeters exchanged monthly for film badges and at industry recommended frequency for TLDs?
  - 3. Are dosimetry reports reviewed by the RSO when they are received?
  - 4. Are the records NRC Forms or equivalent? [10 CFR 20.2104(d), 10 CFR 20.2106(e)]
    - ◆ NRC-4 "Cumulative Occupational Exposure History" completed?
    - ◆ NRC-5 "Occupational Exposure Record for a Monitoring Period" completed?
  - 5. If a worker declared her pregnancy, did licensee comply with [10 CFR 20.1208]?
    - ◆ Were records kept of embryo/fetus dose per 10 CFR 20.2106(a)?
- f. Are records of exposures, surveys, monitoring, and evaluations maintained [10 CFR 20.2102, 10 CFR 20.2103, 10 CFR 20.2106]

## 7. PUBLIC DOSE

- a. Are gauges stored in a manner to keep doses below 100 mrem in a year? [10 CFR 20.1301(a)(1)]
- b. Has a survey or evaluation been performed per 10 CFR 20.1501(a)? Have there been any additions or changes to the storage, security, or use of surrounding areas that would necessitate a new survey or evaluation?
- c. Do unrestricted area radiation levels exceed 2 mrem in any one hour? [10 CFR 20.1301(a)(2)]
- d. Are gauges being stored in a manner that would prevent unauthorized use or removal? [10 CFR 20.1301]
- e. Records maintained? [10 CFR 20.2103, 10 CFR 20.2107]

## 8. OPERATING AND EMERGENCY PROCEDURES

- a. Have operating and emergency procedures been developed?
- b. Do they contain the required elements?
- c. Does each operator have a current copy (telephone numbers) of the operating and emergency procedures?
- d. Does each operator have a current copy (telephone numbers) of the operating and emergency procedures?

## 9. LEAK TESTS

- a. Was each sealed source leak tested every 6 months or at other prescribed intervals?
- b. Was the leak test performed as described in correspondence with NRC and according to the license?
- c. Are records of results retained with the appropriate information included?
- d. Were any sources found leaking and if yes, was NRC notified?

## 10. MAINTENANCE OF GAUGES

- a. Are manufacturer's procedures followed for routine cleaning and lubrication of gauge?
- b. Does the source or source rod remain attached to the gauge during cleaning?
- c. Is non-routine maintenance performed where the source or source rod is detached from the gauge? If yes, was it performed according to license requirements (e.g., extent of work, individuals performing the work, procedures, dosimetry, survey instrument, compliance with 10 CFR 20.1301 limits)?

## 11. TRANSPORTATION

- a. DOT-7A or other authorized packages used? [49 CFR 173.415, 49 CFR 173.416(b)]
- b. Package performance test records on file?
- c. Special form sources documentation? [49 CFR 173.476(a)]
- d. Package has 2 labels (ex. Yellow-II) with TL, Nuclide, Activity, and Hazard Class? [49 CFR 172.403, 49 CFR 173.441]
- e. Package properly marked? [49 CFR 172.301, 49 CFR 172.304, 49 CFR 172.310, 49 CFR 172.324]
- f. Package closed and sealed during transport? [49 CFR 173.475(f)]
- g. Shipping papers prepared and used? [49 CFR 172.200(a)]
- h. Shipping papers contain proper entries? (Shipping name, Hazard Class, Identification Number (UN Number), Total Quantity, Package Type, Nuclide, RQ, Radioactive Material, Physical and Chemical Form, Activity, category of label, TL, Shipper's Name, Certification and Signature, Emergency Response Phone Number, Cargo Aircraft Only (if applicable)) [49 CFR 172.200, 49 CFR 172.201, 49 CFR 172.202, 49 CFR 172.203, 49 CFR 172.204, 49 CFR 172.604]
- i. Shipping papers within drivers reach and readily accessible during transport? [49 CFR 177.817(e)]
- j. Secured against movement? [49 CFR 177.834]
- k. Placarded on vehicle, if needed? [49 CFR 172.504]
- l. Proper overpacks, if used? [49 CFR 173.25]
- m. Any incidents reported to DOT? [49 CFR 171.15, 16]

## **12. AUDITOR'S INDEPENDENT SURVEY MEASUREMENTS (IF MADE)**

- a. Describe the type, location, and results of measurements. Do any radiation level exceed regulatory limits?

## **13. NOTIFICATION AND REPORTS**

- a. Was any radioactive material lost or stolen? Were reports made? [10 CFR 20.2201, 10 CFR 30.50]
- b. Did any reportable incidents occur? Were reports made? [10 CFR 20.2202, 10 CFR 30.50]
- c. Did any overexposures and high radiation levels occur? Reported? [10 CFR 20.2203, 10 CFR 30.50]
- d. If any events (as described in items a through c above) did occur, what was root cause? Were corrective actions appropriate?
- e. Is the licensee aware of telephone number for NRC Emergency Operations Center? [(301) 816-5100]

## **14. RECORD KEEPING FOR DECOMMISSIONING**

- a. Records kept of information important to decommissioning? [10 CFR 30.35(g)]
- b. Records include all information outlined [10 CFR 30.35(g)]

## **15. BULLETINS AND INFORMATION NOTICES**

- a. NRC Bulletins, NRC Information Notices, NMSS Newsletters, received?
- b. Appropriate training and action taken in response?

## **16. SPECIAL LICENSE CONDITIONS OR ISSUES**

- a. Did auditor review special license conditions or other issues (e.g., non-routine maintenance)?

## **17. DEFICIENCIES IDENTIFIED IN AUDIT; CORRECTIVE ACTIONS**

- a. Summarize problems/deficiencies identified during audit.
- b. If problems/deficiencies identified in this audit, describe corrective actions planned or taken. Are corrective actions planned or taken at ALL licensed locations (not just location audited)?
- c. Provide any other recommendations for improvement.

## **1B. EVALUATION OF OTHER FACTORS**

- a. *Senior licensee management is appropriately involved with the radiation protection program and/or Radiation Safety Officer (RSO) oversight?*
- b. *RSO has sufficient time to perform his/her radiation safety duties?*
- c. *Licensee has sufficient staff to support the radiation protection program?*

## **11. Waste Management**

**Licensed material will be disposed of if needed by Troxler Electronic Laboratories, Inc.**