Haley & Aldrich, Inc.
100 Corporate Place
Suite 105
Rocky Hill, CT 06067

Tel: 860.282.9400
Fax: 860.721.0612
HaleyAldrich.com

HALEY&
ALDRICH

Br. 3

23 January 2012
File No. 00920-090-03

RECEIVED
REGION 1
2012 JAN 26 AM 11:11

Craig Z. Gordon
Senior Health Physicist
Division of Nuclear Materials Safety
U. S. Nuclear Regulatory Commission, Region 1
475 Allendale Road
King of Prussia, PA 19406-1415

Subject: Radioactive Materials License
Haley & Aldrich, Inc.
Amendment to License No. 06-28529-01

03031720

Dear Mr. Gordon:

We are writing to request an amendment to our Materials License No. 06-28529-01 in conjunction with our use of portable nuclear density gauges. Specifically Haley & Aldrich is requesting to add Instrotek (CPN) gauges to our license of authorized uses. It is our intent to rent Instrotek (CPN) gauges on an as needed basis.

In support of this request we offer the following information for your consideration:

1. Equipment which may be rented:

   Nuclide: Cs-137 and Am-241/Be
   Form: Sealed Sources (CPN Model CPN-131)
   Possession Limit: 2 sources not to exceed 10 mCi of Cs-137 and 50 mCi of Am-241/Be
   Authorized Use: To be used as a component of CPN Model MC Series and 500 Series gauges for determination of moisture and density in engineering materials.

2. Radiation Safety Program – Our Radiation Safety Program has been updated to include the new physical location.

All other information in our new license has remained unchanged.

Sincerely yours,
HALEY & ALDRICH, INC.

Scott A. Boston, CIH, CSP
Corporate Health and Safety Officer

Peter A. Falce
Radiation Safety Officer

c: Bruce Wilkinson, Vice President

Attachments:
Amended Form 313
Updated Corporate Radiation Safety Program

C:\Users\paf\Documents\FILES\RSO-nuc gage\NRC license and documents\2012_0123 USNRC License Amendment request.docx

NRC FORM 313 (5-1997)
10 CFR 30, 32, 33
34, 35, 36, 39 and 40

U. S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0120 EXPIRES: 7/31/1999

Estimated burden per response to comply with this information collection request: 7 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. Forward comments regarding burden estimate to the Information and Records Management Branch (T-6 F33), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the Paperwork Reduction Project (3150-0120), Office of Management and Budget, Washington, DC 20503. NRC may not conduct or sponsor, and a person is not required to respond to, an information collection unless it displays a curently valid OMB control number.

APPLICATION FOR MATERIAL LICENSE

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:

DIVISION OF INDUSTRIAL AND MEDICAL NUCLEAR SAFETY
OFFICE OF NUCLEAR MATERIALS SAFETY AND SAFEGUARDS
U.S. NUCLEAR REGULATORY COMMISSION
WASHINGTON, DC 20555-0001

ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS:

IF YOU ARE LOCATED IN:

CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, MAINE, MARYLAND, MASSACHUSETTS, NEW HAMPSHIRE, NEW JERSEY, NEW YORK, PENNSYLVANIA, RHODE ISLAND, OR VERMONT, SEND APPLICATIONS TO:

LICENSING ASSISTANT SECTION
NUCLEAR MATERIALS SAFETY BRANCH
U.S. NUCLEAR REGULATORY COMMISSION, REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PA 19406-1415

ALABAMA, FLORIDA, GEORGIA, KENTUCKY, MISSISSIPPI, NORTH CAROLINA, PUERTO RICO, SOUTH CAROLINA, TENNESSEE, VIRGINIA, VIRGIN ISLANDS, OR WEST VIRGINIA, SEND APPLICATIONS TO:

ATLANTA FEDERAL CENTER
U. S. NUCLEAR REGULATORY COMMISSION, REGION II
61 FORSYTH STREET, S.W., SUITE 23T85
ATLANTA, GEORGIA 30303-3415

IF YOU ARE LOCATED IN:

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

MATERIALS LICENSING SECTION
U.S. NUCLEAR REGULATORY COMMISSION, REGION III
801 WARRENVILLE RD.
LISLE, IL 60532-4351

ALASKA, ARIZONA, ARKANSAS, CALIFORNIA, COLORADO, HAWAII, IDAHO, KANSAS, LOUISIANA, 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 SECTION
U.S. NUCLEAR REGULATORY COMMISSION, REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TX 76011-8064

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
- [X] B. AMENDMENT TO LICENSE NUMBER 06-28529-01
- [ ] C. RENEWAL OF LICENSE NUMBER

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

Haley & Aldrich, Inc.
100 Corporate Place, Suite 105
Rocky Hill, CT 06067-1803

3. ADDRESS(ES) WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED

Haley & Aldrich, Inc.
100 Corporate Place, Suite 105
Rocky Hill, CT 06067-1803

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

Scott Boston, Corporate RSO

TELEPHONE NUMBER
714.616.1565

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. maiximum 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. LICENSEE FEES *(See 10 CFR 170 and Section 170.31)*

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 OFJUNE 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
Peter Falce, Radiation Safety Officer		23 JAN 2012

FOR NRC USE ONLY

TYPE OF FEE	FEE LOG	FEE CATEGORY	AMOUNT RECEIVED $	CHECK NUMBER	COMMENTS
APPROVED BY				DATE	

5. Radioactive Materials

a. Element and Mass Number; b. Chemical and/or physical form; and c. maximum amount that will be possessed at any one time.

Element and Mass Number	Chemical and/or physical form	maximum amount that will be possessed at any one time.
A. Cesium 137	Sealed Sources (Troxler Dwg. No.A. 102112; Humboldt Dwg. No. HIS 2200064; Instrotek (CPN) Model Number 131)	87 millicuries total and no single source to exceed the maximum activity specified in the certificate of registration issued by the U.S. Nuclear Regulatory Commission or an Agreement State.
B. Americium 241	Sealed Sources (Troxler Dwg. Nos. A. 102451 or C-106580; Humboldt Dwg. No. HIS 2200067; Instrotek (CPN) Model Number 131)	408 millicuries total and no single source to exceed the maximum activity specified in the certificate of registration issued by the U.S. Nuclear Regulatory Commission or an Agreement State.

6. Purpose(s) for which licensed materials will be used.

In Troxler Electronic Laboratories Model Nos. 3411B and 3400 Series and Humboldt Scientific, Inc. Model 5001 and Instrotek (CPN) Model MC and 500 Series portable gauging devices for measuring physical properties of materials.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

January 10, 2012

Docket No. 03031720 License No. 06-28529-01
Control No. 576590

Scott A. Boston, C.I.H., CSP
Corporate Radiation Safety Officer
Haley & Aldrich, Inc.
100 Corporate Place
Suite 105
Rocky Hill, CT 06067-1803

SUBJECT: HALEY & ALDRICH, INC., LICENSE AMENDMENT, CONTROL NO. 576590

Dear Mr. Boston:

This refers to your license amendment request dated December 19, 2011 (ML113610544). Enclosed with this letter is the amended license. The storage location at 800 Connecticut Boulevard, East Hartford, Connecticut may be released for unrestricted use.

Please review the enclosed document carefully and be sure that you understand and fully implement all the conditions incorporated into the amended license. If there are any errors or questions, please notify the U.S. Nuclear Regulatory Commission, Region I Office, Licensing Assistance Team, (610) 337-5239, so that we can provide appropriate corrections and answers.

An environmental assessment for this action is not required, since this action is categorically excluded under 10 CFR 51.22(c)(14).

Current NRC regulations and guidance are included on the NRC's website at www.nrc.gov; select **Nuclear Materials; Med, Ind, & Academic Uses;** then **Licensee Toolkits, see our toolkit index page.** You may also obtain these documents by contacting the Government Printing Office (GPO) toll-free at 1-866-512-1800. The GPO is open from 8:00 a.m. to 5:30 p.m. EST, Monday through Friday (except Federal holidays).

Thank you for your cooperation.

Sincerely,

Original signed by Michael Reichard

Michael Reichard
Health Physicist
Materials Security and Industrial Branch
Division of Nuclear Materials Safety

Enclosure: Amendment No. 09

cc: Peter Falce, Radiation Safety Officer

NRC FORM 374

U.S. NUCLEAR REGULATORY COMMISSION

Amendment No. 09

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 the letter dated December 19, 2011,
1. Haley & Aldrich, Inc.	3. License number 06-28529-01 is amended in its entirety to read as follows:
2. 100 Corporate Place Suite 105 Rocky Hill, Connecticut 06067-1803	4. Expiration date February 29, 2016
	5. Docket No. 030-31720 Reference No. 20-20825-02

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. Cesium 137	A. Sealed Sources (QSA, Inc. Models CDCW556 or CDC.805; IPL Model HEG-137)	A. 67 millicuries total and no single source to exceed the maximum activity specified in the certificate of registration issued by the U.S. Nuclear Regulatory Commission or an Agreement State
B. Americium 241	B. Sealed Sources (QSA, Inc. Model AMN.V997; IPL Models 3021, 3027, or Am1.NO2)	B. 308 millicuries total and no single source to exceed the maximum activity specified in the certificate of registration issued by the U.S. Nuclear Regulatory Commission or an Agreement State

9. Authorized use:

A. and B. In Troxler Electronic Laboratories Model Nos. 3411B and 3400 Series and Humboldt Scientific, Inc., Model 5001 portable gauging devices for measuring physical properties of materials.

MATERIALS LICENSE SUPPLEMENTARY SHEET

License Number
06-28529-01

Docket or Reference Number
030-31720
20-20825-02

Amendment No. 09

CONDITIONS

10. Licensed material may be used or stored at the licensee's facilities located at 100 Corporate Place, Rocky Hill, Connecticut, and may be used at temporary job sites of the licensee anywhere in the United States where the U.S. Nuclear Regulatory Commission maintains jurisdiction for regulating the use of licensed material, including areas of exclusive Federal jurisdiction within Agreement States.

    If the jurisdiction status of a Federal facility within an Agreement State is unknown, the licensee should contact the Federal agency controlling the job site in question to determine whether the proposed job site is an area of exclusive Federal jurisdiction. Authorization for use of radioactive materials at job sites in Agreement States not under exclusive Federal jurisdiction shall be obtained from the appropriate state regulatory agency.

11. . Licensed material shall be used by, or under the supervision of, individuals who have received the training described in the application dated November 30, 2005, and have been designated, in writing, by the Radiation Safety Officer. The licensee shall maintain records of individuals designated as users for 3 years following the last use of licensed material by the individual.

12. The Radiation Safety Officer for this license is Peter A. Falce.

13. A. Sealed sources shall be tested for leakage and/or contamination at intervals not to exceed six months or at the intervals specified in the certificate of registration issued by the U.S. Nuclear Regulatory Commission under 10 CFR 32.210 or under equivalent regulations of an Agreement State.

    B. In the absence of a certificate from a transferor indicating that a leak test has been made within the intervals specified in the certificate of registration issued by the U.S. Nuclear Regulatory Commission under 10 CFR 32.210 or under equivalent regulations of an Agreement State, prior to the transfer, a sealed source received from another person shall not be put into use until tested and the test results received.

    C. Sealed sources need not be tested if they are in storage and are not being used; however, when they are removed from storage for use or transferred 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 shall be stored for a period of more than 10 years without being tested for leakage and/or contamination.

MATERIALS LICENSE SUPPLEMENTARY SHEET

License Number
06-28529-01

Docket or Reference Number
030-31720
20-20825-02

Amendment No. 09

D. The leak test shall be capable of detecting the presence of 0.005 microcurie (185 becquerels) of radioactive material on the test sample. If the test reveals the presence of 0.005 microcurie (185 becquerels) or more of removable contamination, a report shall be filed with the U.S. Nuclear Regulatory Commission in accordance with 10 CFR 30.50(c)(2), and the source shall be removed immediately from service and decontaminated, repaired, or disposed of in accordance with Commission regulations.

E. Tests for leakage and/or contamination, limited to leak test sample collection, shall be performed by the licensee or by other persons specifically licensed by the U.S. Nuclear Regulatory Commission or an Agreement State to perform such services. The licensee is not authorized to perform the analysis; analysis of leak test samples must be performed by persons specifically licensed by U.S. Nuclear Regulatory Commission or an Agreement State to perform such services.

F. Records of leak test results shall be kept in units of microcuries and shall be maintained for 5 years.

14. Sealed sources or source rods containing licensed material shall not be opened or sources removed or detached from source rods or gauges by the licensee, except as specifically authorized.

15. The licensee shall conduct a physical inventory every six months, or at other intervals approved by the U.S. Nuclear Regulatory Commission, to account for all sources and/or devices received and possessed under the license. Records of inventories shall be maintained for 5 years from the date of each inventory and shall include the radionuclides, quantities, manufacturer's name and model numbers, and the date of the inventory.

16. Each portable nuclear gauge shall have a lock or outer locked container designed to prevent unauthorized or accidental removal of the sealed source from its shielded position. The gauge or its container must be locked when in transport or storage, or when not under the direct surveillance of an authorized user.

17. Any cleaning, maintenance, or repair of the gauges that requires detaching the source or source rod from the gauge shall be performed only by the manufacturer or by other persons specifically licensed by the U.S. Nuclear Regulatory Commission or an Agreement State to perform such services.

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

MATERIALS LICENSE SUPPLEMENTARY SHEET

License Number
06-28529-01

Docket or Reference Number
030-31720
20-20825-02

Amendment No. 09

19. 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 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. Letter dated November 28, 2005 (ML053460116)
B. Letter dated September 22, 2010 (ML102700579)

For the U.S. Nuclear Regulatory Commission

Date January 10, 2012

By ***Original signed by Michael Reichard***

Michael Reichard
Materials Security and Industrial Branch
Division of Nuclear Materials Safety
Region I
King of Prussia, Pennsylvania 19406

OPERATING PROCEDURE: OP1013

RADIATION SAFETY PROGRAM

PREPARATION AND APPROVALS

VERSION	AUTHORED/DATE	REVIEWED / DATE	REVIEWED / DATE	REVIEWED / DATE	APPROVED / DATE
Ver. 0.0	CLM/ May 2002	DBK/Mar. 2003	SSL/Mar. 2003	GJM/July 2003	DAS/ Aug. 2003
Ver. 1.0	M. Dobday 3/29/05			M. Dobday 3/30/05	M. Dobday 3/30/05
Ver. 1.1	M Dobday 10/05/05			M Dobday 10/05/05	M Dobday 10/12/05
Ver. 1.2	M. Dobday 08/16/06			M Dobday 08/16/06	M Dobday 08/16/06
Ver. 1.3	T. Benedict 09/12/08			T. Benedict 09/12/08	T. Benedict 09/12/08
Ver. 1.4	T. Benedict 10/17/08			T. Benedict 10/17/08	T. Benedict 10/17/08
Ver. 1.5	S. Boston 1/11/2010				B. Wilkinson 1/11/2010
Ver 1.6	S. Boston 4/19/2010				B. Wilkinson 4/19/10
Ver. 1.7	S. Boston 7/13/2011			F. Marowitz 7/13/2011	B. Wilkinson 7/13/2011
Ver. 1.8	S. Boston 11/1/2011				

Total Pages: 28

PURPOSE

To ensure that Haley & Aldrich, Inc. (Haley & Aldrich) staff members are aware of safe operations when working with equipment that contain radioactive sources and that applicable rules and regulations are complied with in regard to the radioactive sources we use during work activities.

To establish a personnel radiation dosimetry program to measure any external, occupational radiation dose received by Haley & Aldrich staff members during the performance of activities which involve potential exposure to ionizing radiation, and to assure that each staff member's exposure is maintained as low as reasonably achievable (ALARA) and below the limits prescribed by law.

BACKGROUND

Haley & Aldrich conducts work activities that require staff members to work with nuclear density gauges and portable X-ray Fluorescence spectrometers (XRF) during field activities. Haley & Aldrich either owns or leases these gauges on an as-needed basis.

Worker safety, equipment approval, use, and storage for these operations must conform to a variety of Federal and State regulations depending on the location. This Haley & Aldrich program has been developed in accordance with applicable Occupational Safety and Health Administration (OSHA), Nuclear Regulatory Commission (USNRC) rules, and applicable state regulations.

Projects involving fieldwork with radioactive devices must be performed by properly trained and licensed staff members. It is the responsibility of each qualified staff member to insure that company policy and USNRC and state regulations are being followed when using or transporting radiation emitting instruments. It is the responsibility of each office's Radiation Safety Officer (RSO) and the Corporate Radiation Safety Officer (CRSO) to audit the radiation safety program and insure that the company is in compliance with all applicable policies and regulations

1.1 Application

This procedure applies to Haley & Aldrich, projects and activities when working with ionizing radioactive sources. The information and requirements within this procedure apply to all activities that involve radiological sources. However, the intent of the program is to satisfy the legal safety requirements when working with nuclear density gauges. It may be necessary that additional safe guards must be considered when working with other types of radiation sources. If there is a question about applicability, the CRSO should be consulted.

EQUIPMENT & SUPPLIES

1.2 Standard Required Equipment

Required	Additional as Required

1. Dosimeter badge
2. Nuclear Density Gauge or other device with any required Department of Transportation (DOT) approved shipping case
3. Information Package for the instrument
   - Bill of Lading
   - USNRC License
   - Any state licenses
   - Proof of gauge training
   - Proof of hazmat training
   - Emergency Response plan
   - Calibration sheet
4. Appropriate locks, cables and chains for securing the device
5. Ring-Pull II Tamper/Security Seal
6. Materials for blocking and bracing the gauge

1.3 Additional Equipment, Specialized Instrumentation, Materials & Company Vehicles

Company-wide, Haley & Aldrich maintains an array of equipment, vehicles and specialized instrumentation for a broad variety of uses in addition to the selected equipment listed above. Additional equipment, vehicles and materials may be rented or purchased as needed with the approval of the project manager. Project equipment needs should be addressed proactively so that interoffice allocation can take place. It is recommended that the field staff familiarize themselves with the use, function and availability of all types of equipment standard to the industry.

1.4 Billing Equipment & Materials

Equipment and materials are billed to the project as used on a daily or per item basis. Completion of equipment usage and billing forms and submission of original receipts for items purchased or rented is required in order to charge the project for reimbursement.

PROCEDURE

1.5 Procedure for Use of Nuclear Gauge

1.5.1 Transportation of Equipment

The location of each gauge must be known at all times. Failure to comply with the regulations could result in heavy fines or loss of the privilege of owning the gauges. Please follow these steps:

- The user should be properly trained in the use of nuclear density gauges.
- The user should be in possession of your personal LUXEL (Landauer) or equivalent whole body dosimeter badge (a.k.a. personal monitoring devise) when handling or operating the gauges.
- Fill out the "Gauge Utilization Log Form" located in the cabinet that is associated with the gauge being taken and leave it in the cabinet.
- Fill out a geotechnical equipment usage billing form located in the equipment room and place it in the bin marked "Nukes and Seismographs".
- If the gauge is transferred to another site and/or another Haley & Aldrich Field Representative, inform the equipment manager.

Under current U.S. DOT regulations, the gauge is considered under transport during the loading of the vehicle, movement of the vehicle on public roads, unloading of the vehicle, and during temporary storage of the gauge away from the approved storage area.

The U.S. DOT requires that the gauge be transported in a properly labeled carrying case. **The case must be locked and tamper/security seal applied.** The required labels are:

- At least two (2) "Yellow II" radiation labels, placed on opposite sides of the case (not the top or bottom) which must also denote contents, activity, and the Transportation Index of the package.
- One "USDOT 7A Type A" package label, with Reportable Quantity (RQ) designation.

Note: sometimes these labels are combined into one larger label.

All possible means shall be provided to ensure that the equipment is fully secured in the transporting vehicle and the equipment is away from the passenger compartment. When transporting in an enclosed vehicle (car or van), the vehicle will be locked, the case will be locked and fastened to the vehicle and tamper/security seal applied. When transporting in an open bed vehicle, the gauge must be securely fastened and locked to the truck bed using two locks. Both locks must prevent the box and gauge from being taken. One lock must also prevent the box from being opened so that the gauge can be removed from the box. A tamper/security seal must be applied to the hasp mechanism.

At all times during transport, the operator will have immediately accessible (that means it must be taken out of the case and kept with the driver) a package containing the following:

- Properly completed Bill of Lading for each gauge, including the tamper/seal identification number
- Emergency response procedures and contacts
- Current Leak Test
- Materials License
- Calibration Sheet
- Package of user Certification Certificates (specifically the current user's certificate)

Transportation of licensed material will be carried out in accordance with all applicable requirements of the DOT, found in Title 49 of the Code of Federal Regulations (CFR). Haley & Aldrich will maintain current copies of applicable DOT regulations. In addition, transportation under our Massachusetts materials license will be in accordance with 105 CMR 120.770. Transportation under our New Hampshire materials license will be in accordance with He-P 4037.06 and NHRCR. Transportation under our Rhode Island materials license will be in accordance with the RI Rules and Regulations for the Control of Radiation, Section C.7. Transportation under our Maine materials license will be in accordance with 10-144A CMR 220. Transportation under our New York license will be in accordance with 12 NYCCR Part 38. Transportation under our Washington State materials license will be in accordance with 246-220 through 222 WAC. Transportation under our Virginia license will be in accordance with 12 VAC5-481. Transportation within Maryland will be in accordance with COMAR 26.12.01.01. Transportation within Indiana will be in accordance with 410 IAC 5.

1.6 Utilization Procedures

Only trained and licensed staff members may use a nuclear density gauge.

When not being used in the field, the gauge must be secured in the appropriate case and returned to its permanent storage area as soon as possible. The gauge is to be used for its intended purpose only. By doing so, this will maintain any radiation exposure to "ALARA".

When the gauge is in the field, the Haley & Aldrich staff member must maintain control over the gauge at all times. The gauge shall never be left unattended.

When using the equipment, a personnel monitoring device must be worn that has been assigned to the staff member.

1.7 Maintenance and Leak Test Procedures

Periodic maintenance will include cleaning the nuclear gauge. During any maintenance activity, a personnel monitoring device must be worn.

Any maintenance (e.g., cleaning) will always be performed with the radioactive source in the safe shielded position in accordance with the manufacturer's directions or recommendations. More extensive maintenance that requires removal of the source from its shielded position or removal of the source rod from the device will be performed by the gauge manufacturer. No maintenance will be performed by any staff member that involves removing the source or placing it in an unshielded position.

Leak tests will be performed at intervals not to exceed 6 months (or other interval as approved by USNRC or an Agreement State) using a Leak Test Kit, from an approved laboratory, in a manner outlined in the supplier's instructions for collecting the leak test sample. Typically leak tests will be done by the RSO. Upon collection of the test, the samples will be sent for analysis. The lab shall analyze the sample using an approved monitoring method and furnish a certificate that shows the removable activity to be less than 0.005 microcuries.

Leak test results are maintained for a minimum of five years. Only gauges with current leak tests may be transported. If a gauge exceeds six months between leak tests it is removed from service and kept in our storage facility until a leak test is completed.

1.8 Emergency Procedure

1.8.1 Physical Damage to the Gauge

In the event of physical damage to a gauge, the following will be performed:

- Immediately cordon off an area around the gauge. An area radius of 15 ft. will be sufficient.
- If a vehicle is involved, it must be stopped until the extent of contamination, if any, can be established.
- A visual inspection of the gauge is to be made to determine if the source housing and/or shielding has been damaged.
- Describe the present conditions and follow the instructions of the RSO.
- Haley & Aldrich emergency contacts are listed in Table 1. State agency emergency contacts are listed below.

In the event the gauge is lost or stolen, immediately notify the appropriate RSO.

Evaluate the condition of the gauge. Determine if the source(s) are present and if they are in the shielded position (if applicable). If the source(s) are out of the gauge they must be located immediately.

Arrange for a radiation survey to be conducted as soon as possible by a knowledgeable person using appropriate radiation detection instrumentation. This person should be a licensee staff member or a consultant competent in the use of radiation survey meters. If using a Troxler or Humboldt gauge, the gauge operation manual contains a radiation profile chart that gives the normal radiation levels near the gauge. The radiation survey readings can be compared to the radiation profile for the gauge contained in the gauge operation manual to determine if the readings are normal.

Make necessary notifications to local authorities as well as the USNRC as required. Even if not required to do so, you may report any incident to the appropriate regulating authority. Contacts:

- **USNRC:** USNRC's Emergency Operations Center at (301) 816-5100, which is staffed 24 hours a day and accepts collect calls. USNRC or Agreement State notification is required when gauges containing licensed material are lost or stolen, when gauges are damaged or involved in incidents that result in doses in excess of 10 CFR 20.2203 limits, and when it becomes apparent that attempts to recover a source stuck below the surface will be unsuccessful. USNRC reporting requirements and time frames are found in 10 CFR 20.2201-2203.
- **Massachusetts:** Massachusetts Radiation Control Program 24-hour emergency number, 617.427.2913. Massachusetts reporting requirements and time frames are found in 105 CMR 120.
- **Maine**: Maine Radiation Control program at 207.287.5676. Maine reporting requirements and timeframes are found in 10-144A CMR 220.
- **New Hampshire**: NH Radiological Health Section Normal (0800-1630) Business Hours (800) 852-3345 x 4588. After Normal Business Hours NH State Police: (603) 271-3636. New Hampshire reporting requirements and time frames are found in "New Hampshire Rules for the Control of Radiation."
- **New York**: During Normal (0800-1700) Business Hours (518) 402-7550. After Normal Business Hours NY State Emergency Management Office: (518) 457-2200.
- **Connecticut**: CT DEP 24 Hour Emergency Response Center at (860) 424-3338.
- **Washington**: Radiological Emergency Preparedness (REP) Section 24 Hour Emergency Response Telephone Line (206) NUCLEAR (682-5327).
- **Virginia**: Normal business hours (M-F; 8 a.m. to 5 p.m.) Radiological Health Program (804) 864-8150. After normal business hours (24/7) Department of Emergency Management (800) 468.8892.
- **Maryland:** Normal business hours (M-F; 8 a.m. to 5 p.m.) Radiological Health Program (410) 537-3300. After normal business hours, nights weekends, holidays (866) 633-4686.
- **Indiana:** Radiological Emergency Telephone Numbers: Business Hours – Emergency Response Coordinator: 317.351.7190 x 257 After Business Hours – 317.233.8115

1.8.2 Broken Locks and/or Tamper/Security Seal

If the gauge user, transporter or recipient of a gauge notices a broken lock and/or missing tamper/security seal, they shall immediately notify the RSO **prior** to opening the shipping container.

The RSO, in consultation with an on-site licensee staff member shall determine the proper procedure for opening the container and examining its contents.

Minimum procedural steps to be taken include:

Evaluate the condition of the gauge. Determine if the source(s) are present and if they are in the shielded position (if applicable). If the source(s) are out of the gauge the case must be secured and notifications made to the appropriate regulatory authority as detailed in 4.4.1.

Arrange for a radiation survey to be conducted as soon as possible by a knowledgeable person using appropriate radiation detection instrumentation. This person should be a licensee staff member or a consultant competent in the use of radiation survey meters. If using a Troxler or Humboldt gauge, the gauge operation manual contains a radiation profile chart that gives the normal radiation levels near the gauge. The radiation survey readings can be compared to the radiation profile for the gauge contained in the gauge operation manual to determine if the readings are normal.

Make necessary notifications to local authorities as well as the USNRC as required. Even if not required to do so, you may report any incident to the appropriate regulating authority as indicated in 4.4.1.

1.9 Tamper/Security Seals

Each time a gauge leaves an approved storage area, the gauge must be in a locked transportation case with a tamper/security seal applied across the hasp that also holds the lock. The tamper/security seals currently used are the Ring-Pull II Security Seal and may be obtained from Lab Safety Supply.

Each office with an RSO assigned has been issued a unique color-code associated with the tamper/security seals:

Boston: Green
Costa Mesa: Blue
East Hartford: White
Manchester: Orange
Portland: Red
Virginia: Yellow

Each Ring-Pull II security seal has a unique identification number which must be copied onto the Bill of Lading or common carrier transportation bill. The staff member licensee receiving the gauge shall ensure that the tamper/security seal is the proper color and has the proper identification number prior to removing the seal and unlocking the case.

RSOs are responsible for monitoring the application of the tamper/security seal program.

When checking out gauges, staff member licensees shall ensure they have enough security seals to secure the gauge for each days travel.

1.10 Personnel Monitoring Program

This section of the Operating Procedure (OP) has been developed to assure compliance by establishing a personnel radiological exposure monitoring program, which specifies the criteria for the use of personnel radiation dosimeters, the procedures for issuing and maintaining the equipment, and the procedures for documentation and notification of exposure data.

Personnel radiation dosimeters shall be worn at all times by each Haley & Aldrich staff member who:

- enters a restricted area;
- enters an area where he/she may be exposed to radiation dose rates in excess of 0.5 mREM/hour; or
- Uses an instrument included on our materials license that emits ionizing radiation (Nuclear Density Gauges and XRF's.)

Haley & Aldrich requires all personnel using or transporting nuclear density gauges, using and XRF or entering a restricted area be in possession of a Landauer Luxel optically stimulated luminescence (OSL) Type "B" (X-ray, beta, gamma, and fast neutron) dosimeter badge. Landauer is a NVLAP accredited dosimetry processing lab (NVLAP Lab Code 100518-0.)

Each badge will have a wear period of 3 months. Old badges should be exchanged for a new badge before the 25th of the exchange month.

Effective January 1, 1994, changes were made in the allowable absorbed radiation dose limits by the USNRC. The Agreement States followed these same changes and currently apply as follows:

1 Adult staff members using this device shall not receive an annual dose equivalent to greater than 5 REM from gamma and neutron radiation.

2 A declared pregnant female (embryo/fetus) shall not receive, during the term of her pregnancy, a dose equivalent to greater than 0.5 REM. If her cumulative dose during this period is greater than 0.45 REM at the time of her declaration, any additional dose during the balance of the period will be limited to 0.05 REM.

3 Any minors working in the area of or using these devise(s) shall not receive an annual dose equivalent to greater than 10% of that stated in 1, above.

4 Access of the general public to this device, either in storage or in use, shall be restricted to the extent that their annual dose equivalent is not greater than 0.1 REM. The radiation profile of the device indicates a dose rate of 2.0 mREM/hr at a distance of three (3) feet. No member of the general public shall remain within a distance of less than six (6) feet (0.05 mREM/hr) from the device for a period of greater than 2000 hours per calendar year. A storage area for multiple devices may require a greater distance or shielding.

Each Landauer radiation Dosimetry Report shall be reviewed by the RSO to ensure no staff member is exceeding annual dose limits. Landauer reports shall be initialed by the RSO to indicate that the review has been completed. To date no Haley & Aldrich staff member has ever reached an annual dose limit.

However, if this were to occur, the staff member, their staff manager and the RSO shall meet to determine a work strategy to prevent excessive exposure.

An annual review with all personnel shall be made to assure compliance with this program and assess staff member's annual exposures to assure compliance with ALARA.

1.10.1 Wearing the Dosimeter Badge

Dosimeter badges must be worn in the area between the neck and waist. They are usually clipped to a shirt pocket or belt. They can be worn under chemical protective clothing, if such clothing is being worn. They must be donned prior to performing activities and worn each successive day that such exposure to ionizing radiation may occur. Dosimeter badges are only to be worn by the individual to whom they have been assigned.

The loss of a dosimeter badge or its control must be reported to the RSO immediately. Future work involving potential exposure to ionizing radiation meeting the criteria established in this OP will not be undertaken until a replacement dosimeter badge has been assigned.

1.10.2 Availability of Dosimetry Records

At any time, at the request of the staff member, the RSO will provide copies of any and/or all personnel radiation dosimetry records for that staff member.

1.10.3 Staff members With Previous Exposure History

Any new Haley & Aldrich staff member, who has had previous occupational exposure to radiation within the last twelve months, must disclose in a written, signed statement, the nature and amount of the occupational dose that the individual may have received during that time period. If the staff member's dose for the current quarter has exceeded 0.1 REM, they will not be allowed to work on projects or activities involving radiological exposure until the next quarter.

1.10.4 Subcontractors to Haley & Aldrich Working with and Around Radiation

Subcontractors to Haley & Aldrich, who will participate in activities on Haley & Aldrich projects that meet the criteria established in this OP requiring the use of personnel radiation dosimeters, shall institute their own effective program that conforms with regulatory standards in 10 CFR 20 and 29 CFR 1910.96 and good business practices. This program must be obtained from the subcontractor by the Project Manager (PM) responsible for hiring the subcontractor and submitting to the RSO for approval prior to the commencement of work.

1.10.5 Radiation Detection Instruments

Haley & Aldrich will have access within a reasonable time frame from any job site, at least one appropriate, calibrated survey meter for a timely evaluation of source integrity following an incident. Each instrument should be capable of measuring between 1 microsievert per hour (0.1 milliREMs per hour) and 1 millisievert per hour (100 milliREMs per hour). Each survey instrument will be calibrated by the manufacturer at least once a year to ensure readings remain within the stated accuracy range. Before using a survey instrument, Haley & Aldrich staff members must check the response of the

instrument with a dedicated calibration source that is supplied with the instrument. If the instrument does not respond properly, it shall not be used.

1.11 Inventories

Haley & Aldrich will conduct inventories, at intervals not to exceed 6 months, to account for all sealed sources and devices received and possessed under our license. The RSO shall maintain records of the inventories for at least 5 years from the date of the inventory. The inventory records will include:

- The radionuclide and amount (in units of Becquerel's or curies) of byproduct material in each sealed source;
- The manufacturer's name, model number, and serial number of each device containing byproduct material;
- The location of each sealed source and device; and
- The date of the inventory.

1.12 Annual Audit of Radiation Safety Program

All RSO's are required to perform an annual audit of their radiation safety program. The audit shall determine if:

- The program has developed, documented, and implemented a radiation program commensurate with the scope and extent of licensed activities and sufficient to ensure compliance with the regulations.
- Appropriate procedures and engineering controls are used to achieve occupational doses and doses to members of the public that are ALARA.
- Review, at least annually, the content and implementation of our radiation program.
- Review the status of any past deficiencies and their corrective actions.
- Issue a list of program deficiencies and proposed corrective actions.

Haley & Aldrich will maintain records of the company radiation protection program. The RSO will ensure that annual audits are conducted. The audits will be of sufficient detail to ensure that:

- The Haley & Aldrich program is abiding by State or USNRC and DOT regulations and the terms and conditions of the license (e.g., periodic leak tests, inventories; only trained, approved individuals use gauges independently).
- The Haley & Aldrich radiation protection programs' content and implementation achieve occupational doses and doses to members of the public that are ALARA.
- All appropriate records of all appropriate information (e.g., records of personnel exposure, leak tests, inventory, and training of gauge users) have been maintained.

When the RSO has completed the annual audit it shall be submitted to the CRSO and the Licensee. The CRSO and the Licensee shall:

- Review the annual audit and any deficiencies found.
- Approve or revise any proposed corrective actions.
- Suggest any additional corrective or preventative actions.
- Suggest program changes and goals.

The CRSO and the Licensee shall indicate their review by initialing the audit report.

1.13 Waste Management

Disposal of the licensed material will be accomplished by either of the following methods in accordance with Section 20.2001 of 10 CFR Part 20.

- Returned to the manufacturer for proper disposition.
- Transfer to a licensed burial facility as approved by Federal Regulations.
- Selling of instrument to another licensed user.

1.14 Gauge Transfer

Transferring of gauges containing licensed material will be accomplished as follows:

- Determine if the company to receive the Haley & Aldrich equipment is in an USNRC or Agreement State.
- Haley & Aldrich shall obtain a copy of the company's USNRC or state materials license.
- Haley & Aldrich shall determine if the company's license has expired and if the equipment being transferred is covered by their license. The company accepting the device must have that specific device listed on their License; examples: Troxler 4650, Humboldt 5001, etc.
- No equipment may be transferred if there are any licensing problems.
- Using a survey meter, determine the activity of each gauge at a distance of 1 meter in mREM
- A Haley & Aldrich "Radioactive Transfer Sheet" must be completed for each piece of equipment to be transferred.
- The following information must be included on the "Radioactive Transfer Sheet":
  - Gauge manufacturer
  - Gauge Model Number
  - Gauge Serial Number
  - Source Serial Numbers
  - Survey reading of gauge at 1 meter (must be less than 5 mREM/hr)
  - Date of last leak test
  - Name of Haley & Aldrich RSO
  - Name and address of company where equipment is being transferred

  - Company's license number and expiration date
  - Name of company representative

- Attach to the transfer sheet the following:
  - Copy of the receiving company's USNRC or state materials license.
  - Copy of the original transfer sheet from manufacturer to Haley & Aldrich
  - Copy of most recent leak test results
  - Copy of Special form source document
  - Copy of Bill of Lading
- Submit form and attachments to the RSO.
- RSO approves transfer by signing the "Radioactive Transfer Sheet."
- The representative of the purchasing company approves of the transfer by signing the transfer form.
- Gauge is shipped following DOT regulations. The case shall be locked and a tamper/security seal shall be applied.
- A letter is sent to the USNRC and/or State agency notifying them of the transfer.
- All records of the gauge transfer shall be documented and kept on file.

1.15 Obtaining an Nuclear Regulatory Commission (USNRC) or State Agreement License

Locations desiring to possess and use a portable nuclear gauge containing radioactive material must obtain a license issued by the regulatory agency having jurisdiction over their state or territory. Certain states, called Agreement States have entered into agreements with the USNRC to license and regulate certain radioactive materials within their borders. In the non-agreement states, Puerto Rico, the Virgin Islands, the USNRC has jurisdiction. In general, USNRC and Agreement State regulations and licensing requirements are comparable.

In general, an application form must be submitted describing:

- Name and address of applicant
- Locations where radioactive materials will be used
- Type, form, and maximum amount of radioactive material to be possessed
- Purposes for which licensed material will be used
- Individuals responsible for radiation safety program and their training/experience
- Training for persons using licensed material
- Facilities and equipment
- Radiation Safety Program

1.16 Amendments and Renewals to a License

It is Haley & Aldrich's obligation to keep the license current by requesting amendments whenever the information originally submitted is no longer valid or when the licensee wishes to make a change that affects the license. In general, license amendments must be submitted and approved by the CRSO before making the requested change (e.g., changing the location of the licensed activities or acquiring licensed materials not listed on the license). The licensing agency should be notified of any changes in personnel listed on the license as soon as possible. In the State of New Hampshire, a request to change personnel listed on the license must be submitted prior to notifying the State of the change.

Radioactive materials licenses have expiration dates and must be periodically renewed. If a licensee submits a license renewal application at least 30 days before the expiration date, the license is automatically extended until the regulatory agency acts upon the application.

It is extremely important the staff members and RSO's be aware of the statuatory requirements associated with each license they manage. In states with reciprocal agreements, the license is typically for a designated period of time (i.e. on e year) and the number of working days within that state is restricted (i.e. 180 days).

Prior to making any amendments to a license, including changing the name of the RSO, the CRSO shall contact the applicable state agency and request information regarding the proper format to make the change.

1.17 Training for Individuals Working in or Frequenting Restricted Areas

Any individual operating the nuclear gauge or frequenting the restricted storage area will be required to attend a portable gauge manufacturer's training course or equivalent course that meets the criteria in Appendix D of NUREG-1556 Vol.1, Rev.1. Haley & Aldrich training shall cover requirements of the Haley & Aldrich Radiation Safety Program operating procedure. The training shall also cover applicable Agency regulations for the state the operator will be working in. Regulations covered may include USNRC 10 CFR Parts 30 – 36, 39, 40 and 70, Massachusetts 105 CMR 120.000, New Hampshire Part He-P 4070, Rhode Island Rules and Regulations for Radiation Control, Maine 10-144A CMR 220, New York 12 NYCCR Part 38, Washington WAC 246-220 through 222, Maryland COMAR 26:12.01.01, Indiana 410 IAC 5 and/or other state regulations as required.

The RSO will keep a copy of each individual's training certificate on file.

In addition, any individual operating the nuclear gauge will be in possession of a copy of this OP and be versed in operating and emergency procedures. It is required that each trained operator shall participate in a Hazmat DOT refresher class every three years when shipping gauges by ground and every two years if shipping gauges by air. It is Haley & Aldrich's policy for all staff members who hold a Certificate of Training and are on the company's active list for the use of nuclear equipment to attend a refresher training seminar every two years. Staff members who fail to attend a refresher class will not be allowed to operate any nuclear equipment. It is the responsibility of local RSO to maintain a list of staff members who are and are not allowed to operate radiation emitting devices.

RSO Training shall include the following information:

- Review of radiological fundamentals
- Radiological protection regulatory requirements
- Radioactive material licensing
- Transportation regulations
- Personnel monitoring
- Leak testing
- Record keeping
- Accident response

1.18 Facilities and Equipment

Please refer to the USNRC license for storage requirements.

1.18.1 Signage and Labeling Requirements

The appropriate signage symbol prescribed shall be the colors magenta, or purple, or black on yellow background and be the three-bladed design.

The licensee shall post each radiation area with a conspicuous sign or signs bearing the radiation symbol and the words "CAUTION, RADIATION AREA."

The licensee shall ensure that each container of licensed material bears a durable, clearly visible label bearing the radiation symbol and the words "CAUTION, RADIOACTIVE MATERIAL" or "DANGER, RADIOACTIVE MATERIAL." The label must also provide sufficient information (such as the radionuclide(s) present, an estimate of the quantity of radioactivity, the date for which the activity is estimated, radiation levels, kinds of materials, and mass enrichment) to permit individuals handling or using the containers, or working in the vicinity of the containers, to take precautions to avoid or minimize exposures.

Each licensee shall, prior to removal or disposal of empty uncontaminated containers to unrestricted areas, remove or deface the radioactive material label or otherwise clearly indicate that the container no longer contains radioactive materials.

1.19 Renting Equipment with Radioactive Sources

Haley & Aldrich uses radioactive materials under strict license requirements. These requirements specify the type, activity, source and maximum totals of materials allowed under the license. The current NRC and Agreement State licenses permit the use in Troxler Electronic Laboratories Model Nos. 3411B and 3400 Series and Humboldt Scientific, Inc. Model 5001 and Instrotek (CPN) M Series portable gauging devices for measuring physical properties of materials only. Rental equipment must fall into one of these categories.

1.20 Roles and Responsibilities

1.20.1 RSO

- Assess radiological hazards and prescribe, and ensure the implementation of appropriate radiation safety precautions.
- Will ensure that all terms and conditions of the license are being met and that the information contained in the license is up-to-date.
- Will ensure that the equipment has been leak tested in the required timely manner and that the leak test is performed in the manner prescribed by the equipment manufacturer.
- Will ensure that the use of the equipment is only by individuals that have been authorized by the RSO and that all users wear personnel monitoring equipment when utilizing the equipment.
- Will post USNRC or state Notice to Staff members in a highly visible area.
- Will maintain the records as required by the license and the regulations. These records shall include personnel exposure records, leak test records, training certificates, and annual refresher training records for all users.
- Will ensure that the equipment is properly secured against unauthorized removal at all times when it is not in use.
- Will post "Warning Radioactive Material" on the storage location.
- Will serve as a point of contact and give assistance in case of emergency such as equipment damaged in the field or theft and to notify the proper authorities in case of emergency.
- Will ensure that all users have read and understand the radiation safety operating and emergency procedures.
- Will maintain a roster of active and inactive operators of radiation emitting instruments for their location.
- Will ensure that all individuals that have attended a Training Course for the use of Nuclear Testing Equipment and are on the company's active operator roster will complete the required. Refresher Training every two years.
- Will conduct annual audits of the Licensee's Portable Gauge Operations.
- Will perform periodic field inspections of authorized gauge users.
- Will maintain an up to date inventory of the company's Portable Gauge Equipment.

1.20.2 Staff Member

- Conduct work assignments in compliance with all requirements established for the activity.

- Comply with all radiological postings encountered in the work place.
- Maintain training qualifications necessary to conduct assigned radiological work.
- Immediately report all radiological incidents that occur in the work place to their supervisor, PM, or RSO.
- Ask questions if you are uncertain of the radiological requirements for your work.

Revision History:

1.0 3/29/05 M. Dobday

- 1.1 Removed references to nuclear density gauge and replaced with radiation emitting instruments. Updated and moved list of all radiation emitting instruments to Table 1. Removed requirement for project evaluation by PM, LHSC, and CHSC.
- 2.1 Revised equipment list; limiting the list to items required for operation of density gauge or other radiation emitting instrument.
- 3.2 Updated and moved list of emergency contacts to Table 2.
- 3.5 Fixed typo from 0.2 MREM/hr to 2.0 mREM/hr.
- 3.10 Instrument specific training no longer has to be taken with the equipments manufacturer.
- 3.12.1 Changed the refresher training from annual to every two years.

1.1 9/21/05 M. Dobday

- Revised procedure to include materials requested in MA RCP letter of 8/29/05.
- Modified RSO responsibilities
- Specified regulations to be covered in training
- Modified monitoring program
- Added gauge transfer procedure to section 3.8
- Modified Audit section adding Corporate RSO and licensee review of audit.
- Added MA and NH transportation regulations reference.

1.2 08/16/06 M. Dobday

- Add temporary site storage requirements
- Expanded Gauge Maintenance section
- Gauge Storage at temporary job sites: See NUREG App H
- Gauge Storage restriction at Haley & Aldrich's 1 Davol Square, Providence, RI Office
- Added references to Rhode Island and Maine regulations.

1.3 09/12/08 T. Benedict

- Updated Table 1.
- Updated Table 2.
- Appendix A minor corrections.
- Formatting changes.

1.4 10/17/08 T. Benedict

- Removed Table 1. Current radiation emitting instrument inventories are available on the Company intranet.
- Redesignated Table 2 as Table 1, and updated contact information for WAS office.

1.5 1/11/2010 S. Boston

- Updated contact information for Table 1 – RSO Emergency Contacts.
- 10-144A CMR 220 Transportation was added.
- 10 NYCCR Part 16 and 12 NYCCR Part 38, New York Rules for the Control of Radiation was added.
- Regulations of Connecticut State Agencies (RCSA) 19-24-1 et seq. Rules for the Control of Radiation was added.
- New York 12 NYCCR Part 38 was added.
- R23-68-TAN Rhode Island, Rules and Regulations for the Control of Radiation were added.
- State of Washington, 246-220 through 222, Radiation Protection was added.
- Formatting changes.

1.6 4/19/2010 S. Boston

- Added tamper/security seal requirements.
- Added State of New Hampshire requirement that a request to change personnel listed on the license must be submitted prior to notifying the State of the change.
- Included State of Virginia emergency contact information.
- Updated the RSO for the Maine Office.
- Updated the References to include USNRC, DOT and State of Virginia requirements.

1.6 7/13/2011 S. Boston

- Added language as follows: "When transporting in an enclosed vehicle (car or van), the vehicle will be locked, the case will be locked and fastened to the vehicle and tamper/security seal applied." To Section 4.1.1 Transporation of Equipment, second paragraph from bottom.
- Updated the RSO for the Maine Office.
- Updated change in address for CT License

1.7 11/1/2011 S. Boston

Added Section 4.15 "Renting Equipment with Radioactive Sources". Re-numbered Section 4.15 to 4.16.

TABLE 1 - EMERGENCY CONTACTS

Corporate Radiation Safety Officer **Scott Boston** Tel: 714.371.1816 Cell: 714.616.1565 SBoston@HaleyAldrich.com 3187 Red Hill Avenue, Ste. 155 Costa Mesa, CA 92626-3410 Main No.: 714.371.1800 Fax: 714.371.1866	**BOS Radiation Safety Officer** **RSO for MA, NY and RI Licenses** **Desmond Crawford** Tel: 617.666.3535 Cell: 617.908.0107 DCrawford@HaleyAldrich.com 56 Roland Street Boston, MA 02129 Main No.: 617.666.3535 Fax: 617.666.4649
HAR Radiation Safety Officer **Peter Falce** **RSO for USNRC License (CT & VA)** Tel: 860.290.3133 Cell: 860.989.9440 PFalce@HaleyAldrich.com 100 Corporate Place., Suite 105 Rocky Hill, CT 06067-1803 Main No.: 860.282.9400 Fax: 860.282.9500	**(Alternate) BOS Radiation Safety Officer** **Greg Martin** **Alternate RSO for MA, NY and RI** Tel: 617.886.7452 Cell: 617.908.2699 GMartin@HaleyAldrich.com 465 Medford Street, Ste. 2200 Boston, MA 02129-1400 Main: 617.886.7400 Fax: 617.886.7600
WAS Radiation Safety Officer **Deniz Karadeniz** **Designated Local Contact for USNRC License and work conducted under MD Reciprocity Agreement** Tel: 703.336.6226 Cell: 703.675.6033 DKaradeniz@HaleyAldrich.com 7926 Jones Branch Drive, Suite 870 McLean, VA 22102-3363 Main No.: 703.336.6200 Fax: 703.356.4699	**MAN Radiation Safety Officer** **Frank Marowitz** **RSO for NH License** Tel: 603.391.3301 Cell: 603.566.2633 FMarowitz@HaleyAldrich.com 340 Granite St., 3rd Floor Manchester, NH 03102-4004 Main No.: 603.625.5353 Fax: 603.391.3351
Manufacturer Emergency Response Numbers: Troxler Electronics 919.839.2676 Humboldt Scientific 800.992.4589 Instrotek, Inc. 800.535.5053	**POR Radiation Safety Officer** **Chris Helstrom** **RSO for ME License** Tel: 207.482.4613 Cell: 207.653.8957 CHelstrom@HaleyAldrich.com 75 Washington Avenue, Suite 203 Portland, ME 04101-2617 Main No.: 207.482.4600 Fax: 207.482.4676

APPENDIX A - REFERENCES

- Nuclear Regulatory Commission (USNRC) 10 CFR 20, Standards for Protection Against Radiation
- Nuclear Regulatory Commission (USNRC) 10 CFR 71, Packaging and Transpiration of radioactive Materials
- U.S. Department of Transportation 49 CFR 172.403 Radioactive Materials
- 29 CFR 1926.53, Ionizing Radiation (Construction); 29 CFR 1910.1096, Ionizing Radiation (General Industry)
- NUREG-1556 Vol1, Program Specific Guidance About Portable Gauge Licenses, Nuclear Regulatory Commission (USNRC)
- 105 CMR 120.000, Massachusetts Regulations for the Control of Radiation, MA Department of Public Health
- HE-P 4070 New Hampshire Rules for the Control of Radiation
- 10-144A CMR 220, State of Maine Rules Relating to Radiation Protection
- 10 NYCCR Part 16 and 12 NYCCR Part 38, New York Rules for the Control of Radiation
- R23-68-TAN Rhode Island, Rules and Regulations for the Control of Radiation
- Regulations of Connecticut State Agencies (RCSA) 19-24-1 et seq. Rules for the Control of Radiation
- State of Washington, 246-220 through 222, Radiation Protection
- State of Virginia 12 VAC5-481 Virginia Radiation Protection Regulations
- State of Maryland, COMAR 26.12.01.01 Regulations for the Control of Ionizing Radiation
- State of Indiana, IC 16-41-35 Radiation Control and 410 IAC 5 Regulations for the Control of Radiation

APPENDIX B – RELATED HALEY & ALDRICH PROCEDURES

- OP1010 Health and Safety Plans
- OP4001 General Procedures
- OP4002 Daily Field Report Preparation
- OP4003 Earthwork Control
- OP4004 Nuclear Density Testing

APPENDIX C – FORMS

- Form 4007 Troxler 3411 Standard Log
- Form 4046 Nuclear Density Gauge Utilization Log

APPENDIX D – GLOSSARY

- **Alpha particles** - Two protons and two neutrons that carry a positive charge. They are emitted with high energy from the nucleus of heavy elements during radioactive decay, but lose energy rapidly in passing through material. A couple sheets of paper are sufficient to stop most alpha particles. Since they cannot penetrate even the outer dead layer of our skin, they are not an external hazard.

- Becquerel (Bq) - The **becquerel** (symbol **Bq**) is the SI derived unit of radioactivity. One Bq is defined as the activity of a quantity of radioactive material in which one nucleus decays per second. It is therefore equivalent to s^{-1}. In a fixed mass of radioactive material, the number of becquerels changes with time. Therefore, a sample radioactive decay rate is always stated with a timestamp for short-lived isotopes, sometimes after adjustment to some specific date of interest (in the past or in the future). For example, one might quote a ten-day adjusted figure, that is, the amount of radioactivity that will still be present ten days in the future. This can de-emphasize short-lived isotopes.

- **Beta particles** - Electrons emitted from nucleus of atoms at nearly the speed of light. They have a very small mass compared to protons or neutrons and carry a negative charge. Very energetic beta particles can penetrate 1/2 inch of wood.

- **Personnel Radiation Monitoring Equipment** - A device, often referred to as a dosimeter, designed to be worn or carried by an individual for the purpose of measuring the external radiation dose(s) received. This **equipment** includes film badges, thermo luminescent dosimeters (TLD), and pocket dosimeters. Energy absorbed from the radiation darkens a film emulsion contained within the badge. The amount of darkening, as read by a densitometer at the time of analysis is proportional to the energy absorbed.

- **Gamma rays** - Electromagnetic energy waves emitted from the nucleus of atoms and have no charge. X-rays are the same as gamma rays, except they originate outside the nucleus from processes involving electrons. Other familiar types of electromagnetic wave radiation include: visible light, ultraviolet light, infrared light, microwaves, and radio waves. These differ from X-rays and gamma rays only in wave frequency and energy. Gamma rays are much more penetrating than alpha or beta particles.

- **Neutrons** are elementary particles which are emitted during certain types of nuclear reactions. Neutrons have no charge and are also highly penetrating.

- **RAD** - A measure of the dose of any ionizing radiation to body tissues in terms of the energy absorbed per unit of mass of the tissue. One RAD is the dose corresponding to the absorption of 100 ergs per gram of tissue (1 milliRAD (mRAD)=0.001 rad

- **Radiation** - Includes alpha rays, beta rays, gamma rays, X-rays, neutrons, high-speed electrons, high-**speed** protons, and other atomic particles; but such term does not include sound or radio waves, or visible light, or infrared or ultraviolet light.

- **REM-** A measure of the dose of any ionizing radiation to body tissue in terms of its estimated biological effect relative to a dose of 1 roentgen (r) of X-rays (1 milliREM (mREM)=0.001 REM). The relation of the REM to other dose units depends upon the biological effect under

consideration and upon the conditions for irradiation. Because a REM is relatively large amount, the milliREM (1/1000 of a REM) is often used instead.

- **Restricted area** - Any area access to which is controlled by the employer for purposes of protection of individuals from exposure to radiation or radioactive materials.

- **Curie (Ci)** – This unit is used to express the size of the source. It is the quantity of radioactive material giving 3.7 x 1010 disintegrations per second. This is equal to the number of disintegrations in one gram of Radiation – 226. Note that the sources used in portable gauges are extremely small, with quantities expressed in "milliCuries" mCi.

- **Roentgen (rankin) Equivalent Man (REM)** – This unit is used to express the amount of radiation a person has been exposed to. Under average conditions, a full time staff member working with the portable gauges will receive less than 200 mREM (milliREM) of exposure per year.

APPENDIX E – GENERAL SAFE OPERATING PROTOCOLS

1. Before removing the gauge from its place of storage, check to make sure that the gauge source rod is in the shielded, locked position, then lock and apply tamper seal to the transport case if possible.

2. Sign the gauge out in the utilization log book including the date(s) of use, name(s) of authorized users who will be responsible for the gauge, and the temporary jobsite(s) where the gauge will be used.

3. Never leave the gauge unattended while in your custody.

4. Follow all applicable Department of Transportation (DOT) requirements when transporting the gauge.

5. Do not touch the source rod with your fingers, hands, or any part of your body and always make sure the source rod is in the shielded position after each measurement is made.

6. Always wear your assigned film badge when using the gauge.

7. Never wear another person's film badge.

8. Never store your film badge near the gauge.

9. Always keep unauthorized persons away from the area where the gauge is to be used.

10. Always maintain constant surveillance and immediate control of the gauge when it is not in storage.

11. Never look under the gauge when the source rod is being lowered into the ground.

12. After each measurement, always return the source to the shielded position and lock it there.

13. 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).

14. Return the gauge to its proper storage location at the end of the work shift.

15. When the gauge is returned to storage, so indicate in the utilization log.

16. If the gauge is damaged during transport or while on a job site, follow the Emergency Procedures outlined in OP4004 item 4.2.6 and 4.4 of this procedure.

APPENDIX F – LIST OF USNRC AND STATE LICENSES/REGISTRATIONS

Government	Type	Number
USNRC	License	06-28529-01
Connecticut	Registration	USNRC 06-28529-01
Massachusetts	License	20-8251
Maine	License	05415
Maryland	Reciprocal License	68-001-01
New Hampshire	License	399R
New York	License	C3226
Rhode Island	License	3L-135-01
Virginia	License	059-504-1
Washington	License, Reciprocal	USNRC 06-285529-01

This is to acknowledge the receipt of your letter/application dated 1/23/2012, and to inform you that the initial processing which includes an administrative review has been performed.

Amendment (06-28529-01)

[X] There were no administrative omissions. Your application was assigned to a technical reviewer. Please note that the technical review may identify additional omissions or require additional information.

[ ] Please provide to this office within 30 days of your receipt of this card

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A copy of your action has been forwarded to our License Fee & Accounts Receivable Branch, who will contact you separately if there is a fee issue involved.

Your action has been assigned **Mail Control Number** 576797.
When calling to inquire about this action, please refer to this control number.
You may call us on (610) 337-5398, or 337-5260.

NRC FORM 532 (RI)
(6-96)

Sincerely,
Licensing Assistance Team Leader