NRC FORM 313 (7-96)
10 CFR 30, 32, 33
34, 35, 36, 39 and 40

U. S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0120 EXPIRES: 7/31/99

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, a collection of information 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:

NUCLEAR MATERIALS LICENSING SECTION
U.S. NUCLEAR REGULATORY COMMISSION, REGION II
101 MARIETTA STREET, NW, SUITE 2900
ATLANTA, GA 30323-0199

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)*
   - [X] A. NEW LICENSE
   - [ ] B. AMENDMENT TO LICENSE NUMBER _____
   - [ ] C. RENEWAL OF LICENSE NUMBER _____

2. NAME AND MAILING ADDRESS OF APPLICANT *(Include Zip code)*
   David Rhoe
   LaVilla de Torrimar
   Calle Rey Luis #441
   Guaynabo, PR 00969

3. ADDRESS(ES) WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED
   David Rhoe
   LaVilla de Torrimar
   Calle Rey Luis #441
   Guaynabo, PR 00969

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION
   David M. Rhoe
   TELEPHONE NUMBER
   (787) 790-1401

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. LICENSEE FEES *(See 10 CFR 170 and Section 170.31)*
    FEE CATEGORY 3P
    AMOUNT ENCLOSED $ 750.00

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 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
David M. Rhoe Health/Medical Physicist	David M. Rhoe	3-25-98

FOR NRC USE ONLY

TYPE OF FEE	FEE LOG	FEE CATEGORY	AMOUNT RECEIVED	CHECK NUMBER	COMMENTS
			$		257874
APPROVED BY				DATE	

Byproduct, source, and/or Special Nuclear Material	Chemical and Physical Form	Maximum Amount that Licensee May Possess at Any One Time Under This License
Any byproduct material with Atomic Numbers between 3 and 83 and half-life less than or equal to 120 days.	Sealed sources used for a well counter.	Not to exceed 15 microcuries per radionuclide and 1 millicuries total
Any byproduct material with Atomic Numbers between 3 and 83 and half-life greater than 120 days.	Sealed sources used for a well counter.	Not to exceed 15 microcuries per radionuclide and 1 millicuries total
Any byproduct material with Atomic Numbers between 3 and 83 and half-life less than or equal to 120 days.	Any (Emergency transportation)	Not to exceed 500 millicuries.
Any byproduct material with Atomic Numbers between 3 and 83 and half-life greater than 120 days.	Any (Emergency transportation)	Not to exceed 500 millicuries.
Am-241	Sealed source used for a well counter	15 uCi
Cs-137	Seal source	200 mCi

- Calibration of radiation survey meters
  Permission to calibrate survey meters with either a pulse generator or with a radiation source. If the calibrations are done with a radiation source, the source will either be purchased (Cs-137 Amersham Model 773) or by using another radiation source from another facility The NRC will be informed if a Cs-137 source is bought.

- Radiation check sources for leak testing
  Perform leak test either by using my own counting system or equipment at another facility.

- Transportation of check sources and swipes (smears).
  Check sources that are used for the daily operational check of survey meters or to check the well counter for minimal detectable activity and efficiency.

- Emergency transportation of radioactive material
  Permission to transport any radioactive material (not to exceed 500 mCi) that has been involved in an accident or radioactive sources that have been removed from a patient. These sources will be returned to the licensee that originally owned them. Transportation will be in accordance with DOT regulations.

  Two examples: A patient dies and has I-125 seeds recently inserted in a tumor. The sources are removed but the hospital does not have a license to possess sealed sources. To keep the facility in compliance, these sources need to be transported back to the originating hospital. Or A soil density unit that contains Cs-137 and Am-241 is run over at a construct site. These sources need to be collected and returned to the company for disposal. These are sources that can fit inside a 85 gallon over pack drum or smaller container.

6. The Byproduct material will be used in a private consulting business to leak test radiation sealed sources, check for contamination on laboratory surveys, and/or to calibrate survey meters for research labs, Nuclear Medicine departments, or for the general industries. Any contamination found on wipe (smears) test will be returned to the origin wear the wipe survey was taken.

7. David Rhoe will be the radiation safety officer for this license. David Rhoe has 12+ years of experience working under several different Board Scope License performing leak test and instrument calibration. The past six years he was the Radiation Safety Officer for the VA Medical Center. See NRC License Number 31-02755-05.

   The Radiation Safety Committee – Not Applicable

8. For the purpose of this license, annual training will not be required due to pervious training and work experience.

9. Facilities and equipment

   The facility will consist of the following:
   Radiation survey meters (Eberline 520).
   Gamma well counting system (Scalar with a shielded NaI well).
   Gun safe to secure Cs-137 instrument calibration source (if source is purchased).

10. Radiation Safety Program will follow 10CFR parts 19, 20, 21, 35, and 71.

    Policy and procedures are enclosed.
    A. Leak Testing
    B. Instrument calibration

11. Waste Management Program – Not applicable (All contaminated sources will be returned to the originally owners).

12. The QMP – Not applicable.

Leak Test Policy

Procedure for Leak Testing Sealed Sources

1. All sealed sources shall be tested for leakage:

   - Before initial use
   - At intervals not exceeding 6 months, when the half-life exceeds 30 days, and the amount is greater than 100 uCi.
   - Whenever damage or deterioration of the capsule or of the seal is suspected.
   - When contamination of handling or storage equipment is detected.

2. The apparatus used for counting in a leak test shall be capable of detecting 0.005 uCi of the specific nuclide.

3. Leak tests that reveal the presence of 0.005 uCi of more of removable contamination shall be considered evidence that the sealed source is leaking. It shall be withdrawn from use and sealed in a separate container. The source should be returned to the supplier or sent to some other qualified person for repair or disposal.

4. A survey should be made to determine the extent of contamination of the installation and/or storage area.

5. The leak test procedures will be done by or under the supervision of the Radiation Safety Office. After an individual has been trained by the RSO, that individual will be allowed to perform leak test on there own. The RSO will sign off on all leak test records.

6. Leak test will be perform either by the direct method or by the indirect method.

   DIRECT LEAK TEST – Sealed sources will be wiped directly on and around the unit with either a dry or alcohol wet applicator(s).

   INDIRECT LEAK TEST – Sealed sources in large units or irradiator will be wiped in multiple areas near and around the source shield for leakage and activity. A dry or alcohol wet applicator(s) will be used.

   Foil sources, plated and bar sources will be wiped with a dry or alcohol wet applicator(s) as required by the manufacture. Alpha and Beta sources will be counted by a liquid scintillation counter.

Method for Leak Testing Sealed Sources.

Radionuclide	Method	Detector System	Selected Radiation	Standard
Am-241	Wet or dry wipe	NaI Scintillation Well	0.0595 MeV	Am-241
Cs-137	Wet or dry wipe	NaI Scintillation Well	0.662 MeV	Cs-137
Sr-90	Wet or dry wipe	NaI Scintillation Well	Sr-90 Beta 0.546 MeV Y-90 Beta 2.273 MeV	Sr-90/Y-90
Kr-85	Wet or dry wipe	LSC	C-14 Beta 0.156 MeV Kr-85 Beta 0.687 MeV	C-14
Ni-63	Wet or dry wipe	LSC	Ni-63 Beta 0.067 MeV	H-3
Co-57	Wet or dry wipe	NaI Scintillation Well	0.122, 0.136 MeV	Co-57
C-14	Wet or dry wipe	LSC	C-14 Beta 0.156 MeV	C-14
H-3	Wet or dry wipe	LSC	H-3 Beta 0.0186 MeV	H-3

Other Radionuclides will be added as needed.

- Samples including a background will be counted for a minute period or more.

- Formula = $\frac{\text{Net Counts/min. x dpm or uCi standard}}{\text{Counts of Standard}}$ = uCi of unknown

Enclosed is a copy of the leak test form.

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Other Leak Tests Methods

- Standard Wipe Test – The source is wiped over its **accessible** surface with a moisturized filter paper disk. After drying, the disk is checked for activity using a scintillation counter. Activity levels exceeding 0.005 uCi beta-gamma or 0.0001 uCi alpha are cause for rejection of the source.

- Standard Wipe Test – The source is wiped over its **inaccessible** surface with a moisturized filter paper disk. After drying, the disk is checked for activity using a scintillation counter. Activity levels exceeding 0.005 uCi beta-gamma or 0.0001 uCi alpha are cause for rejection of the source.

- Soak Test – The source is immersed in distilled water and maintained at room temperature for a minimum of 12 hours. After removal of the source, the liquid is checked for activity using a scintillation counter. Activity levels exceeding 0.005 uCi beta-gamma or 0.0001 uCi alpha are cause for rejection of the source.

- Soak Test Ultrasound – The source is immersed in distilled water and maintained at room temperature for a minimum of 1 minute in an ultrasound bath. After removal of the source, the liquid is checked for activity using a scintillation counter. Activity levels exceeding 0.005 uCi beta-gamma or 0.0001 uCi alpha are cause for rejection of the source.

- Soak Wipe Test - The source is immersed in distilled water and maintained at room temperature for a minimum of 5 minutes. After removal of the source, the entire surface of the source is then wiped and is checked for activity using a scintillation counter. Activity levels exceeding 0.005 uCi uCi beta-gamma or 0.0001 uCi alpha are cause for rejection of the source.

- Ampule Leak Test - The ampule is kept in an inverted position on a filter paper disk for a minimum of 16 hours. The filter paper is checked for activity using a scintillation counter. Activity levels exceeding 0.005 uCi uCi beta-gamma or 0.0001 uCi alpha are cause for rejection of the source.

- Bubble Leak Test – The lecture is pressurized to its fill pressure, then soapy water is applied over its valve and neck. If no growing bubbles are seen, the lecture bottle is considered leak free.

- Leak Test Not Applicable – The active area of the source is uncovered or is protected by a very thin coating. Although the deposit is adherent, it is not designed or certified to pass a standard leak test. The inactive portions of the source have been checked using the standards wipe test. Levels of removable activity did not exceed 0.005 uCi beta-gamma or 0.0001 uCi alpha.

Note: In instead of filter paper, Q-Tips or other suitable material may be used

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Leak Test Record
NRC License 31-02755-05

Leak Tested For:	Environmental Management Service
Leak Tested By:	David Rhoe
Standard Source:	Cs-137 Sn232
Standard Activity:	0.25 uCi Nominally
Date of Standard:	Nov. 1, 1983
Date of Leak Test:	Feb.27, 1998
Decay Activity:	0.25 From decay chart
Standard (dpm):	555000
Instrument:	Ludlum Well Counter
Instrument Model Number:	GHT-457
Instrument Serial Number:	165384
Standard (cpm)	40000
Efficiency:	0.07207
Counting time (minutes)	1
Background (cpm)	340
Minimum Detectable Activity:	1.630E-04

Wipe (Smear) Test: All external or accessable surfaces of the source or housing are wiped with a piece of filter paper or other absorbent material which has been moistened with an appropriate solvent and the activity removed is measured.

Source ID and Serial Number	Wipe Test	Sample Activity
Cs-137 Mod#225 Sn4593842	500	0.003
	0	0.000
	0	0.000
	0	0.000
	0	0.000
	0	0.000
	0	0.000
	0	0.000
	0	0.000
	0	0.000
	0	0.000
	0	0.000
	0	0.000
	0	0.000
	0	0.000
	0	0.000

15 sources can be listed on 1 sheet of Paper

This test reveals the 0.005 microcuries or less was present as removable contamination. Should the removable contamination exceed 0.005 microcuries, the source must be removed from use and necessary measures taken according to NRC regulations.

David Rhoe Health/Medical Physicist

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Instrument Calibration Policy
Procedure for Calibration of Survey Meters

Radiation Survey meters will be calibrated with a pulse generator or a radioactive source. Survey meters must be calibrated at least annually and after servicing. (Battery changes are not considered "servicing.")

Model Procedure

1. The source must be approximately a point source.

2. Either the apparent source activity or the exposure rate at a given distance must be traceable by documented measurements to a standard certified by the National Institute of Standards and Technology.

3. A source that has approximately the same photon energy as the environment in which the calibrated device will be employed should be used for the calibration.

4. The source should be of sufficient strength to give an exposure rate of about 30 mR/hr at 100 cm. Minimum activities of typical sources are 85 mCi of cesium –137, 21 mCi of cobalt-60, and 34 mCi of radium-226.

5. The inverse square law and the radioactive decay law must be used to correct for change in exposure rate due to changes in distance or source decay.

6. A record must be made of each survey meter calibration.

7. If the indicated exposure rate differs from the calculated or documented exposure rate is within +/- 20 percent, it will be considered acceptable if a calibration chart or graph is prepared and made available with the instrument, and a correction factor is supplied with the instrument.

8. The following three kinds of scales are frequently used on survey meters:
   - Meters which the user selects a linear scale must be calibrated at no less than two points on the scale. The points should be at approximately 0.20-0.33 and 0.66-0.8 of full scale.
   - Meters that have a multi-decade logarithmic scale must be calibrated at no less than one decade and no less than two points on that decade. . The points should be at approximately 0.20-0.33 and 0.66-0.8 of full scale.
   - Meters that have automatically ranging digital display for indicating rates must be calibrated at no less than one decade and no less than two points on that decade. . The points should be at approximately 0.20-0.33 and 0.66-0.8 of full scale.

9. Readings above 1,000 mR/hr need not be calibrated. However, such scales can be checked for operational and approximately correct response.

10. At the time of calibration, the apparent exposure rate from a built-in or owner-supplied check source must be determined and recorded. Provided that a check source is supplied by the owner or one is attached to the meter.

11. The report of a survey meter calibration should indicate the procedure used and the data obtained. The description of the calibration will include:
    - The owner or user of the equipment.
    - A description of the instrument that includes manufacturer, model number, and serial number.
    - A description of the calibration source, including exposure rate at a specified distance on a specified date and the calibration geometry (parallel or perpendicular).
    - For each calibration, the scale selected, the calculated exposure rate, the indicated exposure rate, the deduced correction factor (calculated exposure rate divided by the indicated exposure rate) will be listed.
    - The apparent exposure rate from the check source (if available).
    - The name of the person who performed the calibration, the date on which the calibration was performed and the agency's license number.

Note: Two copies of the calibration report will be returned with the survey meter. One copy to be kept on file and the other one attached to the survey meter.

Instrument Calibration Report
NRC License 31-02755-05

Calibration For: John Dappolito
Calibrated By: David Rhoe
Check Source ID:
Check Source mR/hr: 1.7
Calibration Geometry: Parallel and center of chamber

Insrtument: Eberline Mod# RO-I SN 142
Calibration Source: Cs-137, Model # 77302, Serial # S-764
Original mR/hr @ 1m: 46.86
Date of original mR/hr: 10-Jan-92
Calibration Date: 22-Jan-98
mR/hr @ 1m on Cal Date: 40.76

Scale mR/hr	Attenuator	Distance meters	mR/hr Calculated	mR/hr Measured	Corr factor Calc/Meas	Trigger Corr factor Avgerage
500	1	0.36	320	425	0.75	0.78
	4	0.36	80	100	0.80	
50	10	0.36	32	41	0.78	0.79
	40	0.36	8	10	0.80	
5	100	0.36	3.2	4.1	0.78	0.77
	400	0.36	0.8	1.05	0.76	

Scale mR	Attenuator	Distance meters	mR Calculated	mR Measured	Corr factor Calc/Meas	Corr factor Avgerage
500 INT	1	0.2525	350	465	0.75	0.75
	1	0.2525	150	200	0.75	
50 INT	1	0.2525	35	50	0.70	0.68
	1	0.2525	15	22.5	0.67	
5 INT	1	0.505	3.5	4.2	0.83	0.92
	1	0.505	1.5	1.5	1.00	

Unable to calibrate the other scales

The formula for % Error is (Calculated/Measured)
Trigger limit is +/- 20 percent (Corr Factors from 1.2 to 0.8)

David Rhoe
Cond Torre de San Miguel
Apt. 2002
Guaynabo, PR 00969
(787) 316-7920 cell
(787) 790-1401 Home

facsimile transmittal

To:	NRC Licensing Branch	**Fax:**	(404) 562-4955
From:	David Rhoe	**Date:**	08/27/98
Re:		**Pages:**	1
CC:			

☐ Urgent ☐ For Review ☐ Please Comment ☐ Please Reply ☐ Please Recycle

Notes: Please send me the following Reg Guides If you could send me 10 copies of each it would save much time for everybody when I find engineering facilities missing them. Thanks!!!

10 CFR Parts 19, 20, 21, 30, and 71

2 copies of part 35 would also be helpful.

Also, I have done some testing on some wipe test counters and may have found a problem. Please review the initial finding on the first three units that I have tested. Please advise me on how to check the calibration on these unit.

Sincerely,
David Rhoe

David Rhoe
VAMC IIR
113 Holland Ave
Albany, NY 12208
518-462-3311 Ext. 2580
Fax 518-462-1239

Facsimile Transmittal

To: Diane Hinc **Fax:** (404) 562-4955

NRC

From: David Rhoe (518) 462-3311 x2580 **Date:** 4/30/1998

Re: NRC Licenses **Pages:** 0 Attached

CC:

☐ Urgent ☐ For Review ☐ Please Comment ☐ Please Reply ☐ Please Recycle

Notes:

Diane,

The company name for Dr. Bordewyk is New Medic Global. The company name for David Rhoe is CRMI (Consultores de Radiacion Medical e Industrial) or the English version is (Medical & Industrial Radiation Consultants). Please place on both licenses, Thanks!!!

My new address effective May 4th will be:

David Rhoe, La Villa de Torrimar, Calle Rey Luis #441, Guaynabo, PR 00969. Phone (787) 790-1401

If you have any questions, please feel free to call me.

Sincerely,

David Rhoe

This is to acknowledge the receipt of your letter/application dated March 25, 1998, and to inform you that the initial processing which includes an administrative review has been performed.

☑ 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 _____.

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** 257874.
When calling to inquire about this action, please refer to this control number.
You may call me at 404-562-4723.

Sincerely,

Licensing Assistant

NRC FORM 532 (RII)
(12-1997)