030-02507

NRC FORM 313
(7-87)
10 CFR 30, 32, 33, 34, 35 and 40

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED BY OMB
3150-0120
Expires: 6-30-90

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.

APPLICATIONS FOR DISTRIBUTION OF EXEMPT PRODUCTS FILE APPLICATIONS WITH:

U.S. NUCLEAR REGULATORY COMMISSION
DIVISION OF FUEL CYCLE AND MATERIAL SAFETY, NMSS
WASHINGTON, DC 20555

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:

U.S. NUCLEAR REGULATORY COMMISSION, REGION I
NUCLEAR MATERIALS SAFETY SECTION B
631 PARK AVENUE
KING OF PRUSSIA, PA 19406

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

U.S. NUCLEAR REGULATORY COMMISSION, REGION II
NUCLEAR MATERIALS SAFETY SECTION
101 MARIETTA STREET, SUITE 2800
ATLANTA, GA 30323

IF YOU ARE LOCATED IN:

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

U.S. NUCLEAR REGULATORY COMMISSION, REGION III
MATERIALS LICENSING SECTION
799 ROOSEVELT ROAD
GLEN ELLYN, IL 60137

ARKANSAS, COLORADO, IDAHO, KANSAS, LOUISIANA, MONTANA, NEBRASKA, NEW MEXICO, NORTH DAKOTA, OKLAHOMA, SOUTH DAKOTA, TEXAS, UTAH, OR WYOMING, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION IV
MATERIAL RADIATION PROTECTION SECTION
611 RYAN PLAZA DRIVE, SUITE 1000
ARLINGTON, TX 76011

ALASKA, ARIZONA, CALIFORNIA, HAWAII, NEVADA, OREGON, WASHINGTON, AND U.S. TERRITORIES AND POSSESSIONS IN THE PACIFIC, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION V
NUCLEAR MATERIALS SAFETY SECTION
1450 MARIA LANE, SUITE 210
WALNUT CREEK, CA 94596

'88 MAR -9 A11:24

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 JURISDICTION.

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

- [ ] A. NEW LICENSE
- [ ] B. AMENDMENT TO LICENSE NUMBER _____
- [X] C. RENEWAL OF LICENSE NUMBER 29-07892-01

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

Stanley W. Siegler, M.D.
Robert J. Gorczyca, M.D.
9 Hospital Drive
Toms River, NJ 08753

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

9 Hospital Drive
Toms River, NJ 08753

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

Stanley W. Siegler, M.D.

TELEPHONE NUMBER: (201) 240-1400

SUBMIT ITEMS 5 THROUGH 11 ON 8½ 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 AND 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 $580.00

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, AND 40 AND THAT ALL INFORMATION CONTAINED HEREIN, IS TRUE AND CORRECT TO THE BEST OF THEIR KNOWLEDGE AND BELIEF.

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

SIGNATURE—CERTIFYING OFFICER	TYPED/PRINTED NAME	TITLE	DATE
	Stanley W. Siegler, M.D.		2-26-88

FOR NRC USE ONLY

TYPE OF FEE	FEE LOG	FEE CATEGORY	COMMENTS	APPROVED BY
REN	Mar 8	7C	8905120158 880712 REG1 LIC30 29-07892-01 PNU	S. Kimball
AMOUNT RECEIVED	**CHECK NUMBER**			**DATE**
$580	1460			3/10/88

"OFFICIAL RECORD COPY" M.10

108490
2-27-88

X-RAY ASSOCIATES, P.A. EST. 1973

STANLEY W. SIEGLER, M.D. • ROBERT J. GORCZYCA, M.D.

February 26th, 1988

U.S. Nuclear Regulatory Commission, Region I
Nuclear Materials Safety Section B.
631 Park Avenue
King of Prussia, PA 19406

Gentlemen:

Enclosed please find two (2) completed applications for renewal of license #29-07892-01.

The current license, as well as the previously submitted documents have been reviewed and we have identified additions and deletions to the previously described documents to reflect our current program.

A check for $580.00 is also submitted.

I hope this will prove satisfatory.

Sincerely,

STANLEY W. SIEGLER, M.D.

SWS:df

encls.

9 HOSPITAL DRIVE, TOMS RIVER, NJ 08753 (201) 240-1400

Item 5

The Radioactive material is similiar to that stated on items 6, 7 and 8 of the United States regulatory license dated the 13th of May, 1983.

Item 6

The purpose for which licensed material will be used is similiar to that stated on item 9 of license dated the 13th of May, 1983.

Item 7

Stanley W. Siegler, M.D. remains responsible for radiation safety program. His training and experience was previously stated on applications for license 29-07892-01.

Item 8

The training for individuals working in the restricted areas i.e. Dr. Stanley W. Siegler and Dr. Robert J. Gorczyca have been previously stated on application for license 29-07892-01.

In addition the training and experience of our licensed nuclear medicine technician is enclosed on Exhibit 1 suppliment A & B.

EXHIBIT 1
SUPPLEMENT A

SUPPLEMENT — U.S. NUCLEAR REGULATORY COMMISSION

TRAINING AND EXPERIENCE
AUTHORIZED USER OR RADIATION SAFETY OFFICER

1. NAME OF PROPOSED AUTHORIZED USER OR RADIATION SAFETY OFFICER	2. FOR PHYSICIANS, STATE OR TERRITORY WHERE LICENSED
William M. Marcus, B.A., R.T.N.M.	

3. CERTIFICATION

SPECIALTY BOARD A	CATEGORY B	MONTH AND YEAR CERTIFIED C
American Registry of Radiologic Technologist	Nuclear Mecicine	November 1985

4. TRAINING RECEIVED IN BASIC RADIOISOTOPE HANDLING TECHNIQUES

FIELD OF TRAINING A	LOCATION AND DATE(S) OF TRAINING B	TYPE AND LENGTH OF TRAINING: CLOCK HOURS IN LECTURE OR LABORATORY	TYPE AND LENGTH OF TRAINING: CLOCK HOURS OF SUPERVISED ON-THE-JOB EXPERIENCE
a. RADIATION PHYSICS AND INSTRUMENTATION	JFK School of Nuclear Medicine Technology, ~~Edison, New Jersey~~	> 100hrs	> 100
b. RADIATION PROTECTION	" "	> 50hrs	> 150
c. MATHEMATICS PERTAINING TO THE USE AND MEASUREMENT OF RADIOACTIVITY	" "	> 100hrs	> 1000
d. RADIATION BIOLOGY	" "	> 20hrs	> 500
e. RADIOPHARMACEUTICAL CHEMISTRY	" "	> 20hrs	> 1000

5. EXPERIENCE WITH RADIATION. *(Actual use of Radioisotopes or Equivalent Experience)*

ISOTOPE	mCi USED AT ONE TIME	LOCATION	CLOCK HOURS	TYPE OF USE
99mTc	30 - 1800	Training & job site	>1500	Doses+Generator
201Tl	4mCi	" "	> 20	Doses
67Ga	6 - 10mCi	" "	15	Doses
123I	1 mCi	" "	> 100	Doses
131I	500uCi- 2mCi	" "	10	Doses

ITEM 8

EXHIBIT 1 Supplement B

WILLIAM M. MARCUS
47 WALNUT STREET, APT. B-3
TOMS RIVER, N.J. 08753

(H) (201) 286-3641

(O) (201) 240-1403

OBJECTIVE:

Seeking a position in the related fields of Nuclear Medicine in which my training and positive attitude can be of benefit to both employer and patients alike.

EDUCATION:

B.A., Biology, 1983, American University, Washington, D.C.
R.T.N.M.(A.A.R.T.), 1985, J.F.K. School of Nuclear Medicine Technology;didactic training.
Newark Beth Israel Medical Center;clinical training.

QUALIFICATIONS AND ACCOMPLISHMENTS:

-Sole N.M.T. in private radiology office responsible for smooth function of department and for monitoring patient health.
-Good patient-relations skills;excellent communication skills--both oral and written.
-Human Relations - helped introduce and promote energy-saving methods at American University. Assisted in the organization of coordinated task systems during summer employment. Catalyst for establishment of intramural sports team at American University.
-Pharmaceuticals - possess knowledge of the actions, uses, and record-keeping requirements relative to dosage form and governmental regulations.

ACTIVITIES AND MEMBERSHIPS:

Contributing Staff Writer, THE AU EAGLE.
Participated in conducting fundraising events for Special Olympics.
Member, The Society of Nuclear Medicine.

EMPLOYMENT HISTORY:

Jefferson Lakes Country Day Camp, Stanhope, N.J.
Counselor-in-Training - Summers 1974, 1975.

Automated Pharmaceuticals, Fairfield, N.J.
Pharmaceutical Technician - Summers 1977, 1978.

Bristol-Myers Products, Hillside, N.J.
Maintenence in Research Facility - Summers 1979, 1980.

Thorn EMI, Inc., Fairfield, N.J.
Industrial Lighting Assembler - Summer 1982.

Hoffmann-LaRoche, Inc., Nutley, N.J.
Production Worker III - 1983.

X-Ray Associates, P.A., Toms River, N.J.
Registered Nuclear Medicine Technologist - 1985 to date.

Item 9

The documents submitted with application dated 4/26/83 remains the same except that Item 9 page 6 of previous application has the following changes:

A. Delete paragraph 1 item B Add:

1. Eon Corporation
   Model # 6201 H,T
   Min. range .1 mR/hr to .5mR/hr.
   Max. range 10 mR/hr to 50mR/hr.

B. Delete under paragraph 3 Dyna Camera Picker Model 2-C and add under paragraph 3 Dyna Camera Picker Model 4/15.

C. Delete under paragraph 4:

1. Specto Scaler 4-Omniwell Counter Picker International Corp.

D. Item 11 of page 12 of previous application regarding lab diagram has minimal changes in the isotope lab. (diagram III). An upgraded plan is submitted (labeled diagram III isotope lab "1988").

DIAGRAM III ISOTOPE LAB "1988"

< 0.1 mr/hr readings in "hot hood area"

ITEM 9

Item 10

Radiation Safety Program

The following changes have been made in documents previously submitted dated April 26, 1983.

1. Page 7 recalibration of survey instruments. 3c. calibration now being performed by:

   Bio-Med Associates
   4 Main St.
   Flemington, NJ 08822

   Their procedures and sources have been approved by NRC and are on file in License No. 29-1496701.

   They are described in the attachments. Exhibit II Bio-Med Associates, Inc. Calibration Procedures.

BIO-MED ASSOCIATES, INC.
4 MAIN STREET FLEMINGTON, NEW JERSEY 08822 201-788-9440

BIO-MED ASSOCIATES, INC.
Calibration Procedures
for
Survey Meters

Item 10
EXHIBIT II

Operating and Emergency Procedures

Calibration of customer's survey meters

1. Refer to specific instructions and methods outlined in Appendix D, Calibration of Instruments, from "A Guide for Preparation of Applications for Medical Programs", NRC Regulatory Guide 10.8 (October 1980).

2. All survey meter with mR/hr scales should be performed with the Cesium-137 source.

3. The exposure rate from the Cesium-137 source has been calibrated with a dosimeter calibrated at the National Bureau of Standards.

4. A two point calibration on each scale (to 1 R/hr) should be performed.

5. The Cesium-137 source and isotope storage closet should be surveyed periodically and documented in a report at least annually.

6. Complete calibration certificate and label. (Samples are attached)

7. Survey meters should be calibrated with the operator standing behind the source shield, outside the useful beam. Employ fixtures for supporting the detector and mirrors for observing the scale. Only personnel wearing radiation monitoring dosimeters should be present when performing a calibration.

8. If the source fails to return to the "off" position, use lead bricks to block the port in the shield. Notify the Radiation Safety Officer.

9. In the event of a fire, the source and shield are fully portable and can be transported without the presence of excessive exposure rates.

Item 10
EXHIBIT II (Con't)

APPENDIX D

CALIBRATION OF INSTRUMENTS

Section 1

METHODS FOR CALIBRATION OF (X- AND GAMMA-RAY) SURVEY METERS, INCLUDING PROCEDURES, STANDARDS, AND FREQUENCY

A. Calibration of survey meters shall be performed with radionuclide sources.

1. The sources shall be approximate point sources.

2. The source activities or exposure rates at given distances shall be traceable by documented measurements to a standard source certified within 5 percent accuracy to the U.S. National Bureau of Standards (NBS) calibrations.

3. The frequency shall be at least annually and after servicing.

4. Each scale of the instrument shall be calibrated at least at two points located at approximately 1/3 and 2/3 of full scale.

5. The exposure rate measured by the instrument shall differ from the true exposure rate by less than 10 percent at the two points on each scale (read appropriate section of the instrument manual to determine how to make necessary adjustments to bring instrument into calibration). Readings within ±20 percent will be considered acceptable if a calibration chart, graph, or response factor is prepared, attached to the instrument, and used to interpret meter readings to within 10 percent for radiation protection purposes.

Note:

Sources of Cs-137, Ra-226, or Co-60* are appropriate for use in calibrations. Since these sources emit rather high-energy photons, they are not suitable for low-energy calibrations that may be required under special circumstances (see Item C below). The activity of the calibration standard should be sufficient to calibrate the survey meters on each scale to be used for radiation protection purposes. Scales up to 1 R/hr should be calibrated, but higher-range scales above 1 R/hr need not be calibrated when they will not be needed for radiation protection surveys. If there are higher ranges, they should at least be checked for operation and approximately correct response to radiation. Otherwise, a cautionary note that they have not been checked should be placed on the instrument.

B. A reference check source of long half-life, e.g., Cs-137 or Ra D and E, shall also be read at the time of the above calibration or as soon as the instrument is received from a calibration laboratory. The readings shall be taken with the check source placed in specific geometry relative to the detector. A reading of this reference check source should be taken:

1. Before each use and also after each survey to ensure that the instrument was operational during the survey.

2. After each maintenance and/or battery change.

3. At least quarterly.

If any reading with the same geometry is not within ±20 percent of the reading measured immediately after calibration, the instrument should be recalibrated (see Item A).

C. The instrument must be calibrated at lower energies if its response is energy dependent and if the instrument is to be used for quantitative measurements in the Xe-133 or Tc-99m energy ranges.

The calibration may be done either:

1. As in Item A above with calibrated standards of radionuclides at or near the desired energies, or

2. As a relative intercomparison with an energy-independent instrument and uncalibrated radionuclides.

Alternatively, the manufacturer's energy response curve(s) may be used to correct instrument readings appropriately when lower-energy radiation is monitored.

D. Records of the above Items A, B-2, B-3, and C must be maintained.

E. Use of Inverse Square Law and Radioactive Decay Law

1. A calibrated source will have a calibration certificate giving its exposure rate at a given distance.

*Minimum activities of typical sources are 85 mCi of Cs-137, 21 mCi of Co-60, and 34 mCi of Ra-226 (to give at least 700 mR/hr at 20 cm).

Item 10
EXHIBIT II (cont)

or its activity, measured on a specified date by the manufacturer or NBS.

a. The Inverse Square Law may be used with any point source to calculate the exposure rate at other distances.

b. The Radioactive Decay Law may be used to calculate the exposure rates or source activities at times other than the calibration date.

2. Inverse Square Law

Consider a "point"* source of radiation at position S, as shown in Figure D-1. Then, the relationship between exposure rates R_1 and R_2 at detector positions P_1 and P_2, which are at distances D_1 and D_2 from S, respectively, is given by the following equation:

$$R_2 = \frac{D_1^2}{D_2^2} \times R_1,$$

where R_1 and R_2 are exposure rates in the same units (e.g., mR/hr, R/hr), and D_1 and D_2 are the distances in Figure D-1 in the same units (e.g., m, cm, ft).

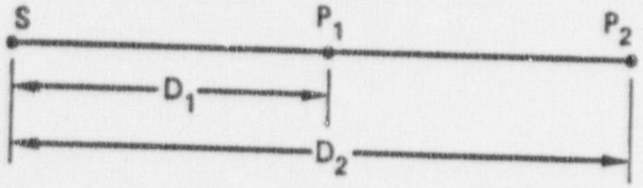

Figure D-1

3. Radioactive Decay Law

Exposure rate t units of time after specified calibration date

$$R_t = R_0 \times e^{-\left[\frac{0.693}{T_{1/2}} \times t\right]}$$

where

R_0 and R_t are in the same units (e.g., mR/hr or R/hr).

R_0 is exposure rate on the specified calibration date.

R_t is exposure rate t units of time later.

$T_{1/2}$ and t are in the same units (years, months, days, etc.).

$T_{1/2}$ is radionuclide half-life.

t is number of units of time elapsed between calibration and present time.

4. *Example:* Source output is given by calibration certificate as 100 mR/hr at 1 foot on March 10, 1975. Radionuclide half-life is 5.27 years.

Question: What is the output at 3 feet on March 10, 1977 (2.0 years)?

a. Output at 1 foot, 2.0 years after calibration date:

$$R = 100 \text{ mR/hr} \times e^{-\frac{(0.693 \times 2.0)}{5.3}}$$

$$= 100 \times 0.77 = 77 \text{ mR/hr at 1 foot on March 10, 1977.}$$

b. Output at 3 feet, 2.0 years after calibration date:

$$R_3 \text{ feet} = \frac{(1 \text{ foot})^2}{(3 \text{ feet})^2} \times 77 \text{ mR/hr}$$

$$= \frac{1}{9} \times 77 = 8.6 \text{ mR/hr at 3 feet, 2.0 years after calibration.}$$

* A source may be considered a "point" source when the source and the radiation detector are small, in any dimension, compared to the distances at which radiation is to be measured. The center of the detector should be at distances D_1 or D_2 as shown in Figure D-1.

Item 10
EXHIBIT II (Cont'd)

2. Item 10 page 8 paragraph C changed to:
   a. The procedure described in Appendix C of regulatory guide 10.8 revision 2 will be used for calibration of dose calibrator.

3. Item 24 page 3d is changed to..
   b. This facility is committed to the ALARA program set forth in Appendix G of Regulatory Guide 10.2 revision 2.

Item 10
con't

Item 11

Unchanged since previous application.

BETWEEN:

LICENSE FEE MANAGEMENT BRANCH, ARM
AND
REGIONAL LICENSING SECTIONS

(FOR LFMS USE)
INFORMATION FROM LTS

PROGRAM CODE: 02200
STATUS CODE: 2
FEE CATEGORY: 7C
EXP. DATE: 19880531
FEE COMMENTS: _____

LICENSE FEE TRANSMITTAL

A. REGION I

1. APPLICATION ATTACHED
APPLICANT/LICENSEE: SIEGLER, S.W. & GORCZYCA, R.J. DRS.
RECEIVED DATE: 880229
DOCKET NO: 3002507
CONTROL NO.: 108490
LICENSE NO.: 29-07892-01
ACTION TYPE: RENEWAL

2. FEE ATTACHED
AMOUNT: $580
CHECK NO.: 14160

3. COMMENTS

SIGNED Doris Jo Foster
DATE 3/7/88

B. LICENSE FEE MANAGEMENT BRANCH (CHECK WHEN MILESTONE 03 IS ENTERED 1_4)

1. FEE CATEGORY AND AMOUNT: 7C $580

2. CORRECT FEE PAID. APPLICATION MAY BE PROCESSED FOR:
AMENDMENT _____
RENEWAL ✓
LICENSE _____

3. OTHER _____
_____

SIGNED S Kimberley
DATE 3/10/88