

VOID SHEET

TO: License Fee Management Branch
FROM: IMAB, NMSS
SUBJECT: VOIDED APPLICATION

Control Number: 020905
Applicant: N.E. AMERICA
Date Voided: 07-30-90
Reason for Void: _____

Failure to respond.

(Region I, Frank Costello, notified & concurs)

[Signature] 8/1/90
Signature Date

Attachment:
Official Record Copy of
Voided Action

FOR LFMB USE ONLY

Final Review of VOID Completed:

- Refund Authorized and processed
- No Refund Due
- Fee Exempt or Fee Not Required

Comments: This was set up w. the
a control in error - The
licensee did not
re-submit

Log completed 0000013
Processed by: [Signature]

ML10
11

(FOR LFMS USE)
INFORMATION FROM LTS

BETWEEN:

License Fee Management Branch, ARM
and
Regional Licensing Sections

Program Code: 03253
Status Code: 3
Fee Category: _____
Exp. Date: 0
Fee Comments: _____

LICENSE FEE TRANSMITTAL

A. REGION *HQ*

1. APPLICATION ATTACHED

Applicant/Licensee: N.E. AMERICA
Received Date: 891215
Docket No.: 3031433
Control No.: 020905
License No.:
Action Type: New License

2. FEE ATTACHED

Amount: _____
Check No.:

3. COMMENTS

New 'E' license

Signed
Date 12-15-89

B. LICENSE FEE MANAGEMENT BRANCH (Check when milestone 03 is entered)

1. Fee Category and Amount: _____

2. Correct Fee Paid. Application may be processed for:

Amendment _____
Renewal _____
License _____

3. OTHER _____

Sign
Date

020905 - New 'E' license

*check to see what happened
on 005502 June-2 Hqs*

(34 app fee pd)

*Admission
7/12/87*

POSSESSION LIMIT INFORMATION

PAGE: 2

MATERIAL TYPE	:	_____	FORM CODE:	___	AGGREGATE CODE:	___
MODEL NUMBER	:	_____				
DESCRIPTION	:	_____				
TOTAL QUANTITY	:	_____	UNIT:	___		
OTHER	:	---	# SOURCES:	___		
MATERIAL TYPE	:	_____	FORM CODE:	___	AGGREGATE CODE:	___
MODEL NUMBER	:	_____				
DESCRIPTION	:	_____				
TOTAL QUANTITY	:	_____	UNIT:	___		
OTHER	:	---	# SOURCES:	___		
MATERIAL TYPE	:	_____	FORM CODE:	___	AGGREGATE CODE:	___
MODEL NUMBER	:	_____				
DESCRIPTION	:	_____				
TOTAL QUANTITY	:	_____	UNIT:	___		
OTHER	:	---	# SOURCES:	___		
MATERIAL TYPE	:	_____	FORM CODE:	___	AGGREGATE CODE:	___
MODEL NUMBER	:	_____				
DESCRIPTION	:	_____				
TOTAL QUANTITY	:	_____	UNIT:	___		
OTHER	:	---	# SOURCES:	___		
MATERIAL TYPE	:	_____	FORM CODE:	___	AGGREGATE CODE:	___
MODEL NUMBER	:	_____				
DESCRIPTION	:	_____				
TOTAL QUANTITY	:	_____	UNIT:	___		
OTHER	:	---	# SOURCES:	___		

Licensee: Nuclear Enterprises America

License No. 29-27838-01

TECHNICAL ASSISTANCE REQUEST

DATE: 14 November 1989

TO: John E. Glenn, Chief, Medical, Academic and Commercial Use Safety Branch, IMNS

FROM: John D. Kinneman, Chief, Nuclear Materials Safety Section B, Region I

SUBJECT: REQUEST FOR TECHNICAL ASSISTANCE

X Control No. 005503 & 105502 (enclosed)

X Letter dated 6 May 1986 (enclosed)

 Suggested change in licensing procedure (enclosed)

 Other (See remarks)

Requested Action:	<u> </u>	<u>X</u>	Amend
	<u> </u>		Custom source/device review
	<u> </u>		Review and comment
	<u> </u>		Provide policy guidance
	<u> </u>	<u>X</u>	Other (See remarks)

Remarks: SEE ATTACHED SHEET

To Be Completed by NMSS

DATE:

The above request has been received by IMAB/IMNS and assigned to (name)

 (phone number). Please contact this individual for a status report if

response is not received by (date)

Signature:
IMAB/IMNS Branch Chief

020905

REMARKS:

See Jackson's notes & Stein's response

- A. NEA requested in their May 6, 1986 application:
 - 1) Possession & distribution of sealed reference sources pursuant to 10 CFR 32.74.
 - 2) Amend registration from California to New Jersey
 - 3) Distribute exempt quantities.
- B. License issued July 24, 1986:
 - 1) Possession of sealed reference sources
 - 2) Distribution to specific licensee only
 - 3) Prohibits commercial distribution of exempt quantities
- C. June 19, 1986 letter from G. Jackson to NEA:
 - 1) Staff to amend the device registry
 - 2) Also lists C/N 005503
- D. Action to be taken:

Control
120904
030-3432

- 1) By RI:
 - a) Corrected Copy to include medical distribution pursuant to 10 CFR 32.74 (29-27838-01MD)
- 2) By HQ:
 - a) Amend registry to change the address of the distribution from California to New Jersey
 - b) Issue an exempt distribution license to NEA (29-27838-02E)

Also 318 - 32.57 - "6L" ^{BI}

020905
030-31433

32.18 ^{"E"}

1) Device amendment Fee

CA-492-D-1A-U

FV 50
Dec-2 Hqs

- Charge Fee
- 1) "E" Dist 32.18
 - 2) "G" Dist 32.57
 - 3) Device Amendment Fee - ONE only.

APR 14 1987

Nuclear Enterprises American
ATTN: Mr. Harris Stuart Targovnik
23 Madison Road
Fairfield, NJ 07006

Dear Sir:

This refers to your letter dated May 6, 1987⁶ requesting three (3) distribution licenses. To distribute exempt quantity sources to persons exempt from the requirements for a license as defined by 10 CFR 30.18 we need information on the following items.

- a. Send a description of the intended use of the sources that demonstrates the byproduct material will not be contained in any food, beverage, cosmetic, drug, or other commodity designed for ingestion or inhalation by, or application to, a human being.
- B. Describe the construction of these sources in sufficient detail to enable us to determine that the byproduct material is in the form of processed chemical elements, compounds, or mixtures, tissue samples, bioassay samples, counting standards, plated or encapsulated sources, or similar substances, identified as radioactive and to be used for its radioactive properties, but is not incorporated into any manufactured or assembled commodity, product, or device intended for commercial distribution.
- C. Send us copies of prototype labels and brochures about the product. In addition, a label on the immediate container or accompanying brochure must also contain appropriate additional radiation safety precautions and instructions relating to the handling, use, storage, and disposal of the radioactive material.
- D. Please provide a written commitment for the requirement of 10 CFR Sections 32.19 (a), (b), (c), (d) and 32.20.
- E. Americium-241 of 0.005 millicuries cannot be distributed under this section.

To distribute Americium-241 to users of the general license as defined by 10 CFR 31.8, you in need to send the information as requested by 10 CFR 32.57 and the appropriate fee to the US NRC Region I Office for processing.

To distribute sources pursuant to 10 CFR 32.74 you need to send the information requested by this part and the appropriate fee to the US NRC Region I Office for processing.

APR 14 1987

Harris Targovnik

2

The current registration for the model 2503/3 is dated October 25, 1974. Since that time we have revised the information that is needed to register a device. Please send us the information requested by the enclosed Regulatory Guide 10.10. This will allow use to amend the registration document as you requested.

Please reference control number 005503 on the response. If we do not receive a reply from you within 30 calendar days from the date of this letter we shall assume that you do not wish to pursue your application and proceed with abandonment of your request.

If you have questions please contact me. I can be reached by phone at (301) 427-9005.

Sincerely,

*Original signed by
Steven L. Baggett*

Steven L. Baggett
Medical, Academic, and Commercial Use
Safety Branch
Division of Fuel Cycle, Medical, Academic,
and Commercial Use Safety

DISTRIBUTION
FC Central File
NMSS r/f
FCML r/f
SBaggett

DFC:FCAB	:	:	:	:	:	:
NAME:SBaggett:cw	:	:	:	:	:	:
DATE:4/14/87	:	:	:	:	:	:

OFFICIAL RECORD COPY

JUN 19 1986

Nuclear Enterprises America
ATTN: Dr. Harris S. Targovnik
Radiology Product Specialist
23 Madison Road
Fairfield, NJ 07006

Gentlemen:

This refers to your application dated May 6, 1986, for a materials license.

We received your check for \$520. Your application, however, is subject to application fees totalling \$810 as specified in fee Categories 3H (\$580) and 3P (\$230) of §170.31 of the enclosed 10 CFR 170. In addition, we have been informed by the Licensing staff that it will be necessary to amend the device registration for your Model 2503/3 Strontium 90 Sealed Source, for which an amendment fee of \$580 is required as specified in §170.31 (9A) of 10 CFR 170. Payment of the additional \$870 should be made to the U.S. Nuclear Regulatory Commission and mailed to my attention at our Washington, D.C. address.

Your application will be processed by the Region I Licensing staff. The additional fee, however, is required prior to issuance of the license. When submitting the fee, please refer to CONTROL NUMBERS 105502 and 005503.

Sincerely,

Original Signed
Glenda Jackson

Glenda Jackson
License Fee Management Staff
Office of Administration

Enclosure:
10 CFR 170

cc: Region I

DISTRIBUTION:

Pending Fee File
Materials Reading File
Weekly Reading File
DW/REJ/NEA

OFFICE: LFMS:ADM
SURNAME: SKimberley:rej
DATE: 6/19/86

LFMS:ADM
GJackson
6/19/86

DEC 15 REC'D

8708100232 860724
REG1 LIC30
29-27838-01 PDR

2/2

020905

Branch: William O. Miller, Chief
License Fee Management Branch
Office of Administration

John E. Glenn, Chief
Nuclear Materials Section B
Division of Engineering and
Technical Programs

03029254

*Hand for
9A and fee*

LICENSE FEE TRANSMITTAL

A. REGION I

1. APPLICATION ATTACHED

Applicant/Licensee: Nuclear Enterprises America

Application Dated: 5/6/86

Control No.: 105502

License No.: New

2. FEE ATTACHED

Amount: \$ 520.00

Check No.: 3306

Region I

3. COMMENTS

Check is to cover control
number 105502 + 105503

Signed Brenda Plaldek

Date 5/20/86

B. LICENSE FEE MANAGEMENT BRANCH

1. Fee Category and Amount: 3P (230)

2. Correct Fee Paid. Application may be processed for:

Amendment _____

Renewal _____

License / _____

Signed Stimberly

Date 6/19/86

APR 17 1987

Nuclear Enterprises America
ATTN: Dr. Harris S. Targovnik
Radiology Product Specialist
23 Madison Road
Fairfield, NJ 07006

Gentlemen:

This refers to Materials License 29-27838-01, which was issued July 24, 1986. The license was issued in accordance with your March 5, 1986 application and your letter dated May 6, 1986.

Through an oversight, the license was issued without the required fee being collected. At the time your March 5, 1986 application was filed, it appeared that your request would be subject to fee Category 3P of §170.31 of the enclosed 10 CFR 170, and an application fee of \$230 was paid. However, since the license was issued to authorize processing for commercial distribution, an application fee of \$460 is required for your March 5, 1986 application as specified in fee Category 3B of §170.31. Accordingly, an additional fee of \$230 is required (\$460 total due minus \$230 paid). Payment of the additional \$230 should be made to the U.S. Nuclear Regulatory Commission and sent to the attention of Sandra Kimberley at our Washington, D.C. address.

We apologize for the delay in notifying you of the additional fee due and for any inconvenience this matter may cause you.

Sincerely,

Original Signed By
Glenda Jackson

Glenda Jackson
License Fee Management Branch
Division of Accounting and Finance
Office of Resource Management

Enclosure:
10 CFR 170

DISTRIBUTION:
Pending Fee File
RM/A R/F
LFMB R/F (2)
SBaggett, NMSS
DW/RIII/NEA

DEC 15 REC'D OFFICE: ARM/LFMB
SURNAME: SKimberley:rej
DATE: 4/16/87

ARM/LFMB
GJackson
4/17/87

6703100248 860724
REG1 LIC30
29-27838-01 PDR

MATERIALS LICENSE

Amendment No. 01

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, 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

- 1. N.E. America
- 2. Princeton Corporate Plaza
7 Deer Park Drive, Suite A2
Monmouth Junction, New Jersey 08852

In accordance with letter dated March 29, 1988,
3. License number 29-27838-01 is amended in its entirety to read as follows:

4. Expiration date August 31, 1991

5. Docket or Reference No. 030-29254

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. Strontium 90
- B. Carbon 14
- C. Chlorine 36
- D. Cobalt 60
- E. Strontium 90
- F. Americium 241

- A. Sealed source (Radio-chemical Centre SIC.7)
- B. Sealed source
- C. Sealed source
- D. Sealed source
- E. Sealed source
- F. Sealed source

- A. Not to exceed 10 millicuries per source
- B. Not to exceed 100 microcuries per source
- C. Not to exceed 5 microcuries per source
- D. Not to exceed 1 microcurie per source
- E. Not to exceed 0.1 microcurie per source
- F. Not to exceed 5 microcuries per source

9. Authorized use

- A. For receipt, possession, and storage of the Thimble Ionization Chamber Calibrator Model 2503 including the preparation and packaging for shipment, and for the distribution to person authorized to receive the licensed material pursuant to the terms and conditions of a specific license issued by the Nuclear Regulatory Commission or Agreement State.
- B. through F. For receipt, possession, storage, preparation and packaging for shipment.

CONDITIONS

- 10. Licensed material shall be used only at Princeton Corporate Plaza 7 Deer Park Drive, Monmouth Junction, New Jersey.
- 11. Licensed material shall be used by, or under the supervision of, Barry Wilson or Harris S. Targovnik.
- 12. Sealed sources containing licensed material shall not be opened.

8905030374 890524
REG1 LIC30
29-27838-01 PNU

MLIQ
"OFFICIAL RECORD COPY"

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License number 29-27838-01

Docket or Reference number 030-29254

Amendment No. 01

(Continued)

CONDITIONS

13. A(1) The sources or detector cells specified in Item 7.A. shall be tested for leakage and/or contamination at intervals not to exceed 6 months. Any source or detector cell received from another person which is not accompanied by a certificate indicating that a test was performed within 6 months before the transfer shall not be put into use until tested.
- (2) Notwithstanding the periodic leak test required by this condition, any licensed sealed source or detector cell is exempt from such leak tests when the source or detector cell contains 100 microcuries or less of beta and/or gamma emitting material or 10 microcuries or less of alpha emitting material.
- B. Any source or detector cell in storage and not being used need not be tested. When the source or detector cell is removed from storage for use or transfer to another person, it shall be tested before use or transfer.
- C. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. If the test reveals the presence of 0.005 microcurie or more of removable contamination, the source or detector cell shall be removed from service and decontaminated, repaired, or disposed of in accordance with Commission regulations. A report shall be filed within 5 days of the date the leak test result is known with the U.S. Nuclear Regulatory Commission, Region I, ATTN: Chief, Nuclear Materials Safety and Safeguards Branch, 475 Allendale Road, King of Prussia, Pennsylvania 19406. The report shall specify the source involved, the test results, and corrective action taken. Records of leak test results shall be kept in units of microcuries and shall be maintained for inspection by the Commission. Records may be disposed of following Commission inspection.
- D. Tests for leakage and/or contamination shall be performed by the licensee or by other persons specifically licensed by the Commission or an Agreement State to perform such services.
14. The licensee shall conduct a physical inventory every 6 months to account for all sources and/or devices received and possessed under the license. Records of inventories shall be maintained for 2 years from the date of each inventory.
15. This license does not authorize commercial distribution of Items 6.B. through 6.F. licensed material.

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License number

29-27838-01

Docket or Reference number

030-29254

Amendment No. 01

(Continued)

CONDITIONS

16. 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 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. Application dated March 5, 1986

May 29, 1988



For the U.S. Nuclear Regulatory Commission

Original Signed By:

Francis M. Costello

By

Nuclear Materials Safety and
Safeguards Branch, Region I
King of Prussia, Pennsylvania 19406

Date

24 MAY 1988

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, 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.

"OFFICIAL RECORD COPY"

Licensee

1. Nuclear Enterprises America
2. 23 Madison Road
Fairfield, New Jersey 07006

3. License number 29-27838-01

4. Expiration date August 31, 1991

5. Docket or Reference No. 030-29254

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. Strontium 90
- B. Carbon 14
- C. Chlorine 36
- D. Cobalt 60
- E. Strontium 90
- F. Americium 241

- A. Sealed source (Radio-chemical Centre SIC.7)
- B. Sealed source
- C. Sealed source
- D. Sealed source
- E. Sealed source
- F. Sealed source

- A. Not to exceed 10 millicuries per source
- B. Not to exceed 100 microcuries per source
- C. Not to exceed 5 microcuries per source
- D. Not to exceed 1 microcurie per source
- E. Not to exceed 0.1 microcurie per source
- F. Not to exceed 5 microcuries per source

9. Authorized use

- A. For receipt, possession, and storage of the Thimble Ionization Chamber Calibrator Model 2503 including the preparation and packaging for shipment, and for the distribution to person authorized to receive the licensed material pursuant to the terms and conditions of a specific license issued by the Nuclear Regulatory Commission or Agreement State.
- B. through F. For receipt, possession, storage, preparation and packaging for shipment.

CONDITIONS

- 10. Licensed material shall be used only at 23 Madison Road, Fairfield, New Jersey.
- 11. Licensed material shall be used by, or under the supervision of, Barry Wilson or Harris S. Targovnik.
- 12. Sealed sources containing licensed material shall not be opened.

8708100186 860724
REG 1 LIC 30
29-27838-01 PDR

3/11/91

MLTB

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License number

29-27838-01

Docket or Reference number

030-29254

(Continued)

CONDITIONS

13. A(1) The sources or detector cells specified in Item 7.A. shall be tested for leakage and/or contamination at intervals not to exceed 6 months. Any source or detector cell received from another person which is not accompanied by a certificate indicating that a test was performed within 6 months before the transfer shall not be put into use until tested.
- (2) Notwithstanding the periodic leak test required by this condition, any licensed sealed source or detector cell is exempt from such leak tests when the source or detector cell contains 100 microcuries or less of beta and/or gamma emitting material or 10 microcuries or less of alpha emitting material.
- B. Any source or detector cell in storage and not being used need not be tested. When the source or detector cell is removed from storage for use or transfer to another person, it shall be tested before use or transfer.
- C. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. If the test reveals the presence of 0.005 microcurie or more of removable contamination, the source or detector cell shall be removed from service and decontaminated, repaired, or disposed of in accordance with Commission regulations. A report shall be filed within 5 days of the date the leak test result is known with the U.S. Nuclear Regulatory Commission, Region I, ATTN: Chief, Nuclear Materials Safety and Safeguards Branch, 631 Park Avenue, King of Prussia, Pennsylvania 19406. The report shall specify the source involved, the test results, and corrective action taken. Records of leak test results shall be kept in units of microcuries and shall be maintained for inspection by the Commission. Records may be disposed of following Commission inspection.
- D. Tests for leakage and/or contamination shall be performed by the licensee or by other persons specifically licensed by the Commission or an Agreement State to perform such services.
14. The licensee shall conduct a physical inventory every 6 months to account for all sources and/or devices received and possessed under the license. Records of inventories shall be maintained for 2 years from the date of each inventory.
15. This license does not authorize commercial distribution of Items 6.B. through 6.F. licensed material.

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License number 29-27838-01
Docket or Reference number 030-29254

(Continued)

CONDITIONS

16. 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 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. Application dated March 5, 1986

6

Date JUL 24 1986

For the U.S. Nuclear Regulatory Commission

Original Signed By:
Jack Davis

By _____
Nuclear Materials Safety and
Safeguards Branch, Region I
King of Prussia, Pennsylvania 19406



Nuclear Enterprises America

23 Madison Road Fairfield, New Jersey 07006 (201) 227-8215

May 6, 1986

L+L = 27338
C30-29254

Nuclear Regulatory Commission, Region 1
Nuclear Material Section B
631 Park Avenue
King of Prussia, Pennsylvania 19406

Dear Sirs:

Enclosed find our completed NRC Form 313 along with payment of associated fees for NRC licenses to possess and distribute sealed reference sources (Class 3P/\$230.00) and to distribute reference sources in exempt quantities (Class 3I/\$290.00). We are asking a change of address on the current registration for our Model 2503/3 10.0 mCi ⁹⁰Sr sealed source. This source, as shown in the enclosed information, was originally registered in the State of California. We would like the current registry address to read:

Distributor: Nuclear Enterprises America
23 Madison Road
Fairfield, New Jersey 07006

Manufacturer: Nuclear Enterprises, Ltd.
Bath Road
Beenham, Reading RG7 5PR
England

Should you require any further information, feel free to contact me at Nuclear Enterprises America.

Sincerely,

NUCLEAR ENTERPRISES AMERICA

Harris Stuart Targovnik, Ph.D.
Radiology Product Specialist

HST/vlp

Enclosures

License Fee Information
on Application.

RECEIVED
MAY 27 10:41
U.S. DEPT. OF ENERGY
FEDERAL BUREAU OF INVESTIGATION

RECEIVED-REGION 1
MAY 9 1986 3:40

8708100200 860724
REQ1 LIC30
29-27838-01 PDR

A THORN EMI company

"OFFICIAL RECORD COPY"

105502

ML10

MAY 09 1986

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.

FEDERAL AGENCIES 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 JERSEY, NEW YORK, PENNSYLVANIA, RHODE ISLAND, OR VERMONT, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION I
NUCLEAR MATERIAL 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
MATERIAL RADIATION PROTECTION SECTION
101 MARIETTA STREET, SUITE 2900
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
MATERIAL RADIATION PROTECTION SECTION
1450 MARIA LANE, SUITE 210
WALNUT CREEK, CA 94596

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 _____
- C. RENEWAL OF LICENSE NUMBER _____

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

Nuclear Enterprises America
23 Madison Rd.
Fairfield, NJ 07006

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

Nuclear Enterprises America
23 Madison Rd.
Fairfield, NJ 07006

~~0700100214 860724~~
REG 1 LIC 30
29-27838-01 PDR

20 MP

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

Harris S. Targovnik

TELEPHONE NUMBER

201-227-8215

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 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)

AMOUNT 230/290
ENCLOSED \$ 520.00

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 TITL 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

Barry Wilson

TITLE

Director Sales/Marketing
Radiation Safety Officer

DATE

3/5/86

ANNUAL RECEIPTS	
< \$250K	\$1M-3.5M
\$250K-500K	\$3.5M-7M
\$500K-750K	\$7M-10M
\$750K-1M	> \$10M

14. VOLUNTARY ECONOMIC DATA
b. NUMBER OF EMPLOYEES (Total for entire facility excluding outside contractors)
c. NUMBER OF BEDS

15. WOULD YOU BE WILLING TO FURNISH COST INFORMATION (Dollar and/or staff hours) ON THE ECONOMIC IMPACT OF CURRENT NRC REGULATIONS OR ANY FUTURE PROPOSED NRC REGULATIONS THAT MAY AFFECT YOU? (NRC regulations permit it to protect confidential commercial or financial--proprietary--information furnished to the agency in confidence)
 YES NO

FOR NRC USE ONLY

TYPE OF FEE

FEE LOG

FEE CATEGORY

COMMENTS

Application May 13th

230

38 "OFFICIAL RECORD COPY"

105502

APPROVED BY

AMOUNT RECEIVED \$230

CHECK NUMBER 3306/1668

3H

ML1B

MAY 09 1986

DATE

6/13/86 / 5/18/87

ITEM 5

Licensed Material

<u>Line #</u>	<u>Element and Mass Number</u>	<u>Chemical or Physical Form</u>	<u>Name of Manufacturer Model #</u>	<u>Maximum Amount</u>
1	^{90}Sr	Sealed Source	Nuclear Enterprises 2503/3	10mCi <i>3071</i>
2	^{14}C	Solid Anodized Source	Amersham	0.1mCi <i>100µb</i>
3	^{36}Cl	Solid Anodized Source	Amersham	0.005mCi <i>19µb</i>
4	^{60}Co	Solid Anodized Source	Amersham	0.001mCi <i>1µb</i>
5	^{90}Sr	Solid Anodized Source	Amersham	0.0001mCi <i>0.1µb</i>
6	^{241}Am	Solid Anodized Source	Amersham	0.005mCi <i>0.005µb</i>

ITEM 6

Items 1-6 are for distributor to NRC licensed users or users licensed through agreement (only as reference or check sources), as outlined in Section 32.74 of 10CFR32.

Specifications for Item 1, which is currently registered with the NRC through the State of California are included for your review.

Items 2-6 are considered exempt quantities as outlined in 10CFR 30.71(b) and 10CFR 31.8 as stated in Section 32.19(a) no more than 10 exempt sources will be shipped at one time. The Americium-241 source shall be labeled as outlined in 10CFR 31.8. -66

7. Training for Individuals working with or Responsible for Radioactive Sources:

Barry Wilson
Radiation Safety Officer
Sales/Marketing Manager
Nuclear Enterprises America
23 Madison Road
Fairfield, N. J. 07006
(201) 227-8215

Education

- (a) Higher National Certificate in Applied Chemistry
 - (b) Licentiate of the Institute of Biology in Biochemistry
- Both of the above qualifications are considered to be equivalent to a BS degree in England.
- (c) Attendance at Radiation Safety Officers course, University of Texas Health Science Center, San Antonio.

Work Experience

From 1964 to 1967 worked for United Kingdom Atomic Energy Authority at the Radiochemical Center, Amersham. Duties included the manufacture of radiopharmaceuticals and radiochemicals labelled with Phosphorus-32 (up to 1 Curie level) using organo-chemical synthesis. Normal day-to-day activities provided an understanding of health physics, rad-waste disposal and appropriate instrumentation. (i.e. survey and counting equipment).

For the past two years have held the position of Sales/Marketing Manager for Nuclear Enterprises America, the U.S. subsidiary of a UK company involved in the development, manufacture and marketing of health physics, radiological and laboratory counting instrumentation.

*The University of Texas Health Science Center
at San Antonio*

CERTIFICATE OF ATTENDANCE

This confirms that the individual designated below participated in

Radiation Safety Officers Course

and completed the designated activity on January 6-10, 1986

Barry J. Wilson
23 Madison Road
Fairfield, NJ 07006

Validation

Barry J. Wilson

Timothy N. Caris
Timothy N. Caris, M.D.

Course Number S TOBO 00 014-6

Total hours received

for this course 36

(10 contact hours equals 1.0 CEU)

7. Training for Individuals working with or Responsible for Radioactive Sources: (Cont'd)

Harris Stuart Targovnik, Ph.D.
Radiological Products Specialist
Nuclear Enterprises America
23 Madison Rd.
Fairfield, N. J. 07006
(201) 227-8215

Education

Ph.D. - 1982, Radiation Biophysics, State University of New York of Buffalo.

Specifically applicable to use of radioactive material:

1. 8 years research experience with Beta and Gamma emitting isotopes for in vitro investigators.
2. 4 years experience as laboratory instructor for undergraduate courses in basic radiation science and radiation biology covering basics and principles of radiation detection, counting, radiation physics, biological effects and principles and practices of radiation protection.
3. Teaching Assistant in radiation science at Western N.Y. Nuclear Facility on S.U.N.Y. at Buffalo campus.

Work Experience

Jan. 13, 1986 to Present: Radiological Products Specialist with Nuclear Enterprises America, 23 Madison Rd., Fairfield, N. J. 07006

Responsibilities and Duties: Marketing/Sales and technical support of radiological dosimetry products.

Jan. 1984 to Present: Faculty Member, Dept. of Radiotherapy, Mt. Sinai Medical Center, One Gustave Levy Pl., New York, NY 10029

Responsibilities and Duties: Director of laboratory research into the synthesis and in vitro/in vivo testing radiolabeled steroid hormones and melanin precursors.

7. Training for Individuals working with or Responsible for Radioactive Sources: (Cont'd)

Sept. 1982 to Jan. 1984: Post-Doctoral Fellow, Dept. of Cancer Biology Laboratory of Radiobiology, Harvard University School of Public Health, 665 Huntington Ave., Boston, MA 02115.

Responsibilities and Duties: Design and perform in vitro investigation with human cells into the biological and biochemical effects of ionizing and non-ionizing radiations.

Radioactive Material Used:

Sealed Sources: ^{137}Cs / ^{90}Sr ^{14}C ^{22}Na / ^{36}Cl ^{241}Am 1.0mCi
10mCi

Unsealed Sources: ^3H 5mCi
 ^{14}C 1mCi
 ^{125}I 20mCi

Procedures familiar with:

1. Radiosynthesis of Organic Components
2. Radiolabeling of mammalian Cells
3. Calibration of Radiation Measuring Equipment (liquid Scintillation Detectors, Gamma Counters, G-M Detectors, Proportional Flow Counters).

8. Training Program

*The course is coordinated and directed by the Radiation Safety Officer, Mr. Barry Wilson.

All Personnel working in or frequenting the site where sources are to be handled will be required to attend a 4-hour course taught in-house on general principles and practices of radiation protection. The material to be covered will include:

- 1) Types of ionizing and non-ionizing radiation and their sources.
- 2) Methods of detection of radiation and radioisotopes.
- 3) Interactions of radiation with mater
- 4) Biological implications of exposures.
- 5) Safe practices in handling radioactive sources and ALARA principles.
- 6) Proper record keeping in the workplace.
- 7) Complete explanation and coverage of Procedures for handling radioactive sources.

9. Facilities and Equipment

All sources (sealed reference standards) are to be shipped to and from Nuclear Enterprises America in DOT approved packaging with proper labels as outlined in 10CFR Section 32.74. Samples are packaged such that the exposure rate at the surface does not exceed

9. Facilities and Equipment (Cont'd)

0.5 mRem/hr. Where applicable, leak tests will be performed by Nuclear Enterprises Ltd. in Beenham, England prior to shipment to Nuclear Enterprises America. Copies of the leak test results will be supplied to the customer and kept on file at Nuclear Enterprises America.

For sources which require storage for 24-96 hours prior to delivery to the end user, a lockable cabinet will be supplied. Total surface contamination and surface removable contamination will be monitored with an appropriate survey meter calibrated in uR/hr. (range 0.005 to 10.0 mR/hr.) and a scaler rate meter with a suitable probe capable of detecting alpha, beta and/or gamma emission at the uCi level. Instruments will be supplied calibrated by Nuclear Enterprises Ltd. and recalibrated at 6-month intervals K & S Associates, 1854 Airplane Drive, Nashville, Tennessee 37210.)

Environmental and personnel monitoring in the work area will be carried out as outlined in Section 20.202 of 10CFR by Digital pocket dosimeters with (0.1mRad) and (0.2m Rad/hr.) resolution.

10. Radioactive Materials Operating Procedures/Safety Program

1) Storage

All radioactive materials, if not immediately shipped to the customer must be stored in a locked steel receptacle provided for this purpose.

2) Purchases

Only sources which have been requisitioned by a licensed (NRC or agreement state) will be ordered. These must be approved by the Radiation Safety Officer.

3) Record Keeping

Records of the disposition of all sources shall be kept in a bound book with the following information logged in:

- a) Date of Receipt of Source
- b) Description of Source (At #, Element, mCi Amt.)
- c) Date of Transfer
- d) Source of source
- e) Destination of Source
- f) Results of leak test/Surface Monitoring

10. Radioactive Materials Operating Procedures/Safety Program (Cont'd)

4) Handling Rules

Sources listed on the license are exempt from leak testing as continued in Section 31.5(c)2ii of 10CFR. Packages are to be surveyed with an appropriate portable survey meter calibrated in uR/hr. (with a range of .005 to 10.0mR/hr.) or a rate meter with sensitivity to alpha, beta and gamma contamination with a range of 0 through 300,000 CPM. Sources are only to be stored and handled in designated area.

5) Authorized Personnel

Company personnel authorized to handle radioactive sources are the Radiation Safety Officer, Radiological Products Specialists and personnel who will handle sources only under their direct supervision.

6) Rules for Handling Radioactive Materials

- 6.1 Do not handle radioactive sources without authorization and/or supervision of Radiation Safety Committee (Radiation Safety Officer and Radiological Products Specialist).
- 6.2 Take care not to drop or jar any radioactive source.
- 6.3 If you believe a source to be defective or broken, report immediately to a member of the Radiation Safety Committee. Do not handle source any further.
- 6.4 Never discard a source in trash or elsewhere.
- 6.5 No radioactive source is to leave the company without authorization by a member of the Radiation Safety Committee.
- 6.6 Under no circumstances are source and reference materials to be removed from their packing.
- 7.6 All packages are to be tested for removable surface contamination (licensable material).

11. Waste Management

Only wipe (leak) test material which are positive for removable licensed material will be treated as radioactive wastes. These samples will be transferred to either another licensed facility with a disposal agreement or directly to a radioactive disposal service.



Nuclear Enterprises America

23 Madison Road Fairfield, New Jersey 07006 (201) 227-6215

RADIOACTIVE MATERIAL

The radioactive material described or contained herein is exempt from NRC or agreement state licensing requirements. Not for human use. Introduction into foods, beverages, cosmetics, drugs or medicinals, or into products manufactured for commercial distribution is prohibited. Exempt quantities should not be combined.

5-822
180-017-01

Labels (as shown above) will be affixed to all shipments of reference sources (items 2 through 6) as per CFR 32.19.

DRAFT

State of California
Department of Public Health
Bureau of Radiological Health, 2151 Berkeley Way, Berkeley, California 94704

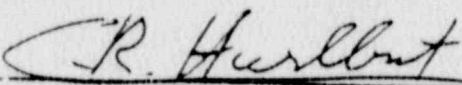
MANUFACTURER'S INFORMATION SHEET
(Sealed Source)

Instructions: (1) Refer to Guide for Applicants for California License to Manufacture and Distribute Sealed Sources or Devices Containing Radioactive Material, Form RH 3063. (2) Where the space provided in this form is insufficient, attach supplemental sheets referencing the part being expanded. (3) Descriptive information must be supported by an annotated drawing or sketch which will provide information concerning the materials of construction and physical dimensions. (4) Submit all material in duplicate to the Bureau of Radiological Health at the address given above.

1. a. Name of Manufacturer Nuclear Enterprises Inc.,
b. Address: Number and Street 935 Terminal Way
City and State San Carlos, California Zip 94070
Name of distributor AS Above
3. Model number Radiochemical Centre Amersham Type SIC7
4. a. Nuclides contained Sr 90 b. Maximum quantity contained 10 mCi
5. Proposed use for which designed Checking the long term stability of a secondary standard x-ray dosimeter.
6. Describe label and/or marking affixed to source or source holder Refer to Drawings No. A04439, A01776, B12691
7. Description
 - a. Chemical form and method of deposition Strontium Titanate in silver foil.
 - b. Window or minimum wall thickness 50 mg/cm² Silver
 - c. Materials of construction Cold rolled silver foil with gold plating.
 - d. Overall dimensions 140 mm x 25 mm
 - e. Method of sealing Welding by cold rolling.
 - f. Mounting Brass former in lead pot
 - g. Classification _____
8. Describe quality control procedures Leak test of source and radiation survey of holder attached photocopies refer
9. Describe prototype tests Dozens already in use in U.S.A. Hundreds in use over 50 countries for 15 years not a single failure yet notified. Test carried out by the radiochemical centre, Amersham, Bucks U.K.

Information disclosed in this form will be withheld from public inspection, pursuant to provision of Title 17, California Administrative Code, §30193(c) OFFICIAL USE ONLY

January 12, 1973


Signature C. R. Hurlbut

RH 3064 11-69

DRAFT

State of California
Department of Public Health

Bureau of Radiological Health, 2151 Berkeley Way, Berkeley, California 94704

MANUFACTURER'S INFORMATION SHEET
(Device Containing Radioactive Material)

Instructions: (1) Refer to Guide for Applicants for a California License to Manufacture and Distribute Sealed Sources or Devices Containing Radioactive Material, Form RH 3063. (2) Where the space provided in this form is insufficient, attach supplemental sheets referencing the part being expanded. (3) Descriptive information must be supported by annotated drawings or sketches which will provide information concerning the materials of construction, physical dimensions, and radiation profile. A copy of the radiological instruction sheet or manual which will be furnished with the device should also be submitted. (4) Submit all material in duplicate to the Bureau of Radiological Health at the address given above.

a. Name of Manufacturer Nuclear Enterprises Inc.,
b. Address: Number and Street 935 Terminal Way
City and State San Carlos, California Zip 94070

c. Name of distributor As Above.

d. Name and model number Reference Source Type No. 2503

e. Nuclides contained Sr 90 b. Maximum quantity contained 10mC

c. Make and model numbers sealed source contained Radiochemical Centre Amersham Type SIC7

d. Proposed use for which designed Checking the long term stability of a secondary standard x-ray dosimeter

e. Describe labels affixed to device Refer to drawings No. A04439, A01776, B12691

7. Description

a. Materials of construction Brass and Lead

b. Overall dimensions 14 cms (Ø) x 11 cms (H)

c. Method of mounting sealed source or source holder Secured by screws one of which is sealed with company seal.

d. Positioning/locking mechanism for bringing the device into the "on" and "off" positions Not applicable. There is a rotary dust cover over the entrance hole.

e. Means used to provide visible indication of "on" and "off" positions Not applicable (see Drg. D21727)

f. Summary of radiation profile from device The external surface dose rate with the entrance hole uncovered is less than 0.75 millirem per hour over the whole surface.

8. Describe quality control procedures Leak Test and Radiation survey
9. Describe prototype testing Dozens already in use in U.S.A. Hundreds in use over 50 countries for 15 years not a single failure yet notified. Test carried out by the Radiochemical Centre, Amersham, Bucks U.K. Notified drop test from 3ft on to concrete.
10. Describe services to device users Leak testing every 6 months by Radiation Detection Co., P.O. Box 1414, Sunnyvale, Calif. 94086. We provide swipe test kits at customer's request. Kits tested by the above company.

Information disclosed in this form will be withheld from public inspection, pursuant to provision Title 17, California Administrative Code, §30193(c) OFFICIAL USE ONLY

January 11, 1973
etc

C. R. Hurlbut
Signature C. R. Hurlbut

Testing for leakage and contamination

Stringent tests for leakage are an essential feature of radioactive sources production. The methods adopted depend on the design and intended application of the source, and also on statutory requirements. Where necessary, tests can be specially modified to meet particular requirements.

The standard methods used for testing radiation sources are listed below. The particular tests used for each type of source are given under the appropriate catalogue entry.

A. Wipe test I

The source is wiped with a swab or tissue, moistened with ethanol or water; the activity removed is measured. Limit: 0.005 μ Ci.

B. Wipe test II

The source is wiped with a swab or tissue, moistened with ethanol or water; the activity removed is measured. Limit: 0.05 μ Ci. (This test is described in Appendix A of B.S. 3513:1962.)

D. Bubble test

The source is immersed in a suitable liquid (ethanol) and the pressure in the vessel reduced to 100mm of mercury. No bubbles must be observed. (This test is described in Appendix B of B.S. 3513:1962.)

E. Emanation test

The source is placed in a glass specimen tube with a length of polyethylene tubing (40 \times 3mm); the tube is closed by a rubber bung and left for 48 hours. The beta activity of the polyethylene is measured immediately with an end window counter.

Limit: 5 c.p.m. above background, corresponding to about 10^{-9} Ci radon in 12 hours.

F. Immersion test I

The source is immersed in water at 50°C for 8 hours and the activity in the water measured. Limit: 0.05 μ Ci.

G. Immersion test II

The source is immersed in water which is raised to 100°C and held at that temperature for 5 min. The water is then removed, the source cooled, and the procedure repeated twice. Sources are passed if the activity extracted in the final procedure does not exceed 0.01 μ Ci.

H. Helium mass spectrograph test

Limit: leak rate of 10^{-9} standard cc/sec.

K. Emanation test (scintillation counting test for radon)

The appliance is immersed in a solution of a phosphor in an organic liquid under vacuum; the leakage of radon is measured by liquid scintillation counting. (DWIGHT, D. J., Radiochemical Centre Report R.176.)

The limit corresponds to about 5×10^{-11} Ci per 24 hours.

L. Immersion test III

The source is immersed in water at 50°C for 4 hours and the activity in the water measured. Limit: 0.005 μ Ci.

Special testing

Many of our sources conform to the 'Special Form' category under IAEA transport regulations (IAEA Safety Series No. 6, 1967).

Our testing programmes include those recommended by the International Standards Organization.

Further information will be supplied on request.

Certification

The results of testing radiation sources are reported in either a **Test Report** or **Certificate of Measurement**.

A Test Report is issued when the source has been the subject of a routine measurement by comparison with a laboratory standard. No limits of accuracy are stated.

A Certificate of Measurement is issued when the source has been individually calibrated. Limits of accuracy are stated.

Calculator

Isotope handling calculator

Code N 72 — Price £3

Gives rapid and direct solutions to handling and shielding problems associated with the use of the common gamma-emitters caesium-137, cobalt-60, gold-198, iodine-131, iridium-192, radium-226 and sodium-24.

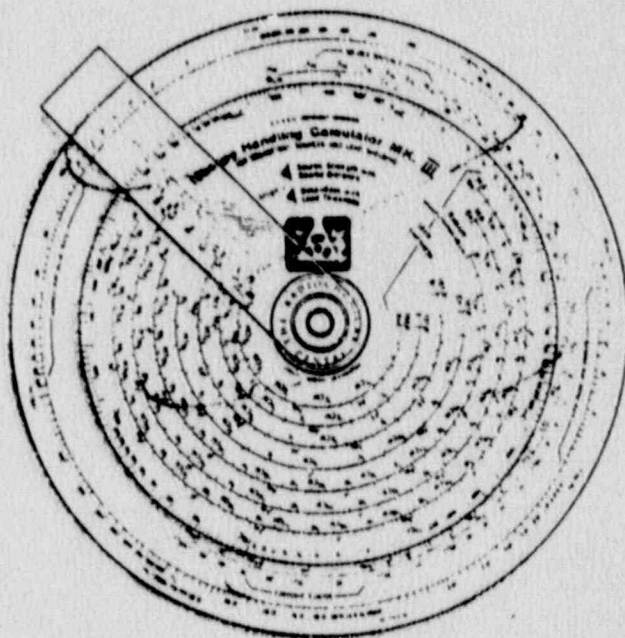


Figure 1

Strontium-90/Yttrium-90

Extended area sources—ceramic

activity mCi	capsule type	code	price £
2	X.112	SIF.41	25
4	X.112	SIF.42	26
5	X.112	SIF.43	27
10	X.112	SIF.44	30
20	X.112	SIF.45	31
50	X.112	SIF.46	33
100	X.112	SIF.47	44

Strontium-90 titanate ceramic pellet sealed in a welded stainless steel capsule, window thickness 0.05mm (fig. 7).

The pellets will also be supplied for encapsulation in customers' holders, prices on request.

Testing

Ceramic pellets: Wipe test (procedure B).

Welded capsules: Wipe test (procedure A).

Immersion test (procedure L).

Extended area sources—metal foil

activity mCi	active dimensions		overall dimensions		code	price £
	length mm	width mm	length mm	width mm		
5	50	3	90	20	SIC.2	13
5	175	3	215	20	SIC.1	15
5	50	12.5	90	25	SIC.6	13
10	100	3	140	20	SIC.3	15
10	100	12.5	140	25	SIC.7	15
20	40	20	50	25	SIC.19	25
40	100	12.5	140	25	SIC.14	33
500	20	10	50	40	SIC.50	80
1000	30	10	60	40	SIC.51	120
2000	45	10	65	30	SIC.52	140
4000	80	10	100	30	SIC.53	180
6000	70	20	90	40	SIC.54	220

Strontium-90 titanate incorporated in silver foil, face thickness 50mg/cm².

SIC.19 and 20 are suitable for gas chromatography detectors; they are protected against corrosion by a coating of gold.

Other strengths and dimensions of foil can be manufactured up to a maximum loading of 1 Ci/cm² active area.

Testing

Immersion test (procedure L).

Point sources

activity mCi	capsule type	code	price £
1	X.111	SIF.31	17
1	X.111	SIF.32	18
10	X.111	SIF.33	22

Strontium-90 in the form of a 1mm diameter glass bead, sealed in a welded stainless steel capsule, window thickness 0.05mm (fig. 9).

Platinum capsules of similar dimensions with aluminium windows 0.05mm thick can be used where β -emission through the end window only is required. They are not as robust as the welded stainless steel construction.

Testing

Wipe test (procedure A).

Immersion test (procedure L).

Line sources

These can be made to order using foil, ceramic or glass bead construction; quotations on request.

Discounts

The prices listed apply to small quantities.

Discounts will be given for large quantities—quotations on request.

Testing:

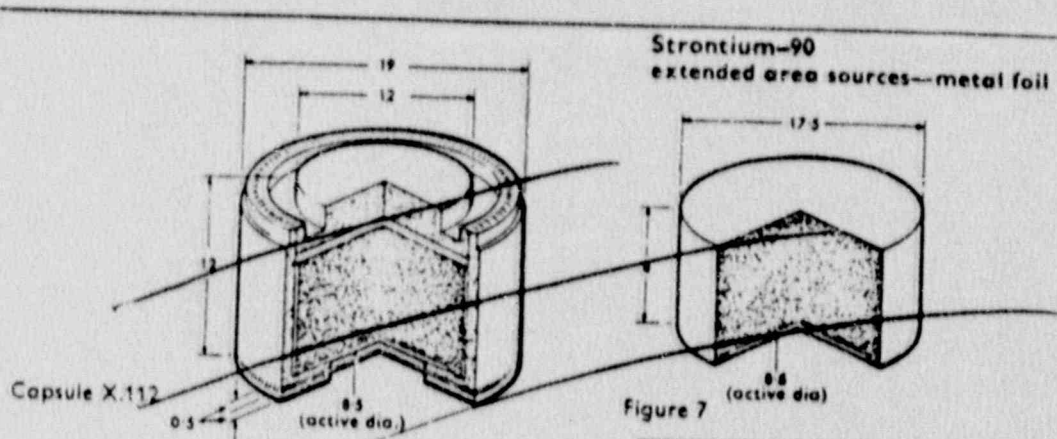
See page 7 for descriptions of tests.

A Test Report is supplied for each source or batch of sources.

Specifications:

Only typical sources are listed.

Enquiries invited for sources to other specifications.



extended area sources—metal foil

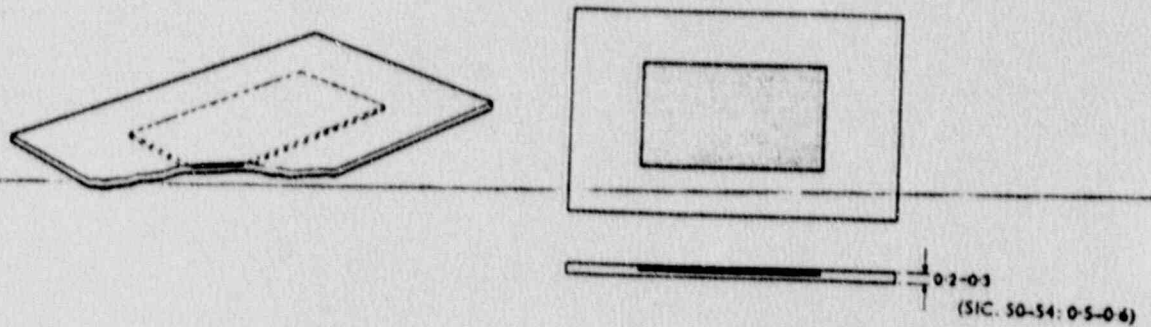
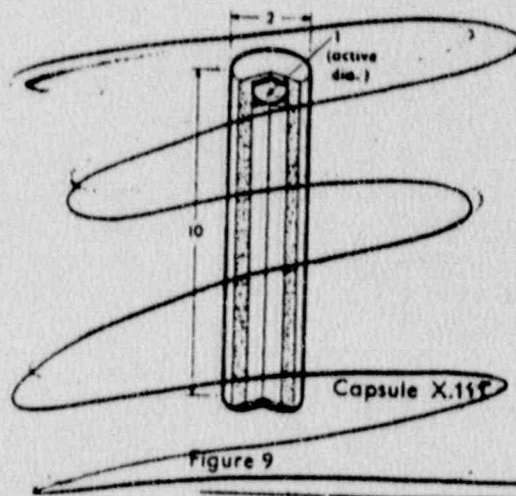


Figure 8

point sources



Dimensions in mm



nuclear enterprises, inc.

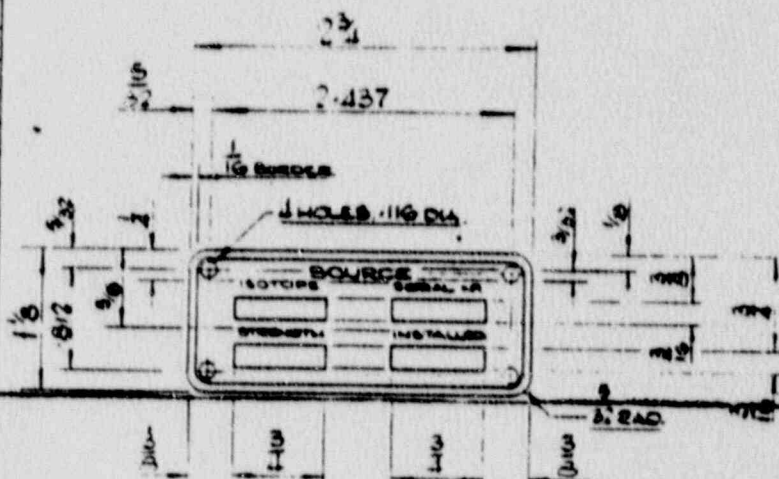
FURTHER COMMENTS ABOUT THE ENCLOSED MATERIAL

The Reference Source Type Number 2503 is used as a calibrating source for a radiation detection probe. The probe is cylindrically shaped; its dimensions are 0.47" diameter x 5.25" long. It is inserted through the hole in the rotary cap (9, drawing 21727) of the chamber until the probe tip is in the center of the ring with apertures in it (3). It is impossible for the probe to touch the radiation source.

The rotary cover (9) with a hole in it is a dust cover provided with a rotary spring loaded to the closed condition. This spring loaded cover also serves as a sideways clamp on the probe when it is inserted in the chamber.

Letter Number 1 will be sent out to all customers in response to their inquiries about the Reference Source.

Letter Number 2 will be enclosed with each Reference Source that is shipped to a customer.



NOTES: 1. BORDER AND BOXES TO BE LEFT NATURAL ANODIZED FINISH.
 2. ENGRAVING BY AND-STENCIL PROCESS.
 3. UNDIMENSIONED LETTERING TO BE 1/16 HIGH.

MANUFACTURE TO DIMENSIONS SHOWN. FINISHING ALLOWANCE ALREADY DEDUCTED.

MATERIAL: ALUM. ALLOY - 6061 T6 (20MS)
 SPEC: BS 1470 1104 HARD
 FINISH: ANODISE TO DTG 810 AND DYE JET BLACK W/ Q42 2510

TOLERANCES UNLESS STATED
 FRACTIONAL: $\pm \frac{1}{64}$
 DECIMAL: $\pm .005$
 DIMENSIONS IN INCHES

ISSUE	DATE	MOD.	SCALE:	DRN.	S. W.	APPR
4	20071	-	1/1	TCD.		
				CHD.		

NUCLEAR ENTERPRISES LTD. EDINBURGH-BEENHAM

TITLE:-
 SOURCE TYPE LABEL

DRG. NO
 A04439

THIRD ANGLE PROJECTION

ITEM

DWG. PART NO.

4 3/4

4 500

1/8 RAO

4 HOLES 5 DIA

CAUTION
RADIOACTIVE
MATERIALS



1/8 SURFACE DO NOT LINE UP

5/16 DIA

3/16 DIA

3/16 DIA

NOTES

- 1. CHARACTERS MARKED THIS 6 TO BE 3/16 HIGH. REMAINDER TO BE 1/4 HIGH. EQUI-SPACED ABOUT 1/8 OF LABEL
- 2. POK LINE TO BE .037 THICK
- 3. ALL ENGRAVING BY ANO-STENCIL PROCESS.
- 4. LABEL TO BE ANOISED TO D70 S10 AND OVER. COLOUR YELLOW TO BB 885C. COLOUR N° 871. ALL ENGRAVING TO BE DARK VIOLET BB 881C. N° 878.

DATE	MOD. NO.
DESIGNED BY	POSS.
CHECKED BY	SC-01

MATERIAL - AL 4050
 SPEC - 881470
 FINISH - SEE N° 871
 SCALE - 1/4" = 1"

MANUFACTURED BY
 BALDWIN INSTRUMENTS LP
 BALDWIN INSTRUMENTS LP
 BALDWIN INSTRUMENTS LP

MANUFACTURED BY
 ISOTOPE DEVELOPMENTS LP
 BALDWIN INSTRUMENTS LP
 BALDWIN INSTRUMENTS LP

BALDWIN



**OVERSIZE
DOCUMENT
PAGE PULLED**

SEE APERTURE CARDS

NUMBER OF OVERSIZE PAGES FILMED ON APERTURE CARDS *1- dupe*

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RECORDS AND REPORTS MANAGEMENT BRANCH**