



3 4456 0555777 8

cy. 18

Radioisotope Distribution Program Progress Report for January 1977

E. Lamb



OAK RIDGE NATIONAL LABORATORY
CENTRAL RESEARCH LIBRARY
DOCUMENT COLLECTION

LIBRARY LOAN COPY

DO NOT TRANSFER TO ANOTHER PERSON

If you wish someone else to see this
document, send in name with document
and the library will arrange a loan.

UCN-7969
(3 3-67)

OAK RIDGE NATIONAL LABORATORY

OPERATED BY UNION CARBIDE CORPORATION FOR THE ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

This report was prepared as an account of work sponsored by the United States Government. Neither the United States nor the Energy Research and Development Administration/United States Nuclear Regulatory Commission, nor any of their employees, nor any of their contractors, subcontractors, or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness or usefulness of any information, apparatus, product or process disclosed, or represents that its use would not infringe privately owned rights.

Contract No. W-7405-eng-26

OPERATIONS DIVISION

RADIOISOTOPE DISTRIBUTION PROGRAM
PROGRESS REPORT FOR JANUARY 1977

E. Lamb

Work Sponsored by
ERDA Division of Biomedical and
Environmental Research

Date Published - March - 1977

NOTICE This document contains information of a preliminary nature.
It is subject to revision or correction and therefore does not represent a
final report.

OAK RIDGE NATIONAL LABORATORY
Oak Ridge, Tennessee 37830
operated by
UNION CARBIDE CORPORATION
for the
ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

OAK RIDGE NATIONAL LABORATORY LIBRARIES



3 4456 0555777 8



CONTENTS

	<u>Page</u>
RADIOISOTOPE PRODUCTION AND MATERIALS DEVELOPMENT.	1
REACTOR-PRODUCED RADIOISOTOPES	1
Reactor Products Pilot Production.	1
ACCELERATOR-PRODUCED ISOTOPES.	1
Cyclotron Products Pilot Production.	1
FISSION PRODUCTS	2
Krypton-85 Enrichment Facility	2
Cesium-137 Pilot Production.	2
Strontium-90 Pilot Production.	3
Short-Lived Fission Production	4
RADIOISOTOPE SALES	4
PUBLICATIONS	5
REPORTS.	5

RADIOISOTOPE DISTRIBUTION PROGRAM
PROGRESS REPORT FOR JANUARY 1977

E. Lamb

RADIOISOTOPE PRODUCTION AND MATERIALS DEVELOPMENT

REACTOR-PRODUCED RADIOISOTOPES

Reactor Products Pilot Production (*R. W. Schleich*)
 (Production and Inventory Accounts)

<u>Processed Units</u>	
<u>Radioisotope</u>	<u>Amount (mCi)</u>
Calcium-47	21

ACCELERATOR-PRODUCED ISOTOPES

Cyclotron Products Pilot Production (*M. R. Skidmore*)
 (Production and Inventory Accounts)

January 1977 ORNL 86-Inch Cyclotron runs for ORNL and non-ORNL programs are given in Table 1.

Table 1. Cyclotron Irradiations and Runs for January 1977

<u>Date</u>	<u>Customer</u>	<u>Product</u>	<u>Target</u>	<u>Total Time (hr:min)</u>	<u>Total Charges</u>
<u>ORNL Programs</u>					
1- 5-77	ORAU	Carbon-11	Boron Oxide	5:50	\$ 697
1-19-77	ORAU	Carbon-11	Boron Oxide	6:05	722
1-21-77	ORAU	Carbon-11	Boron Oxide	<u>6:35</u>	<u>783</u>
				18:30	\$ 2,202
<u>Non-ORNL Programs</u>					
1- 5-77	Pacific Northwest Laboratories	Technetium-95m	Molybdenum-95	11:15	\$ 2,175
1- 5-77	New England Nuclear	Gallium-67	Zinc-68	53:15	8,180
1- 7-77	New England Nuclear	Rubidium-84	Krypton-84	3:45	980
1-11-77	New England Nuclear	Gallium-67	Zinc-68	53:15	8,180
1-18-77	New England Nuclear	Gallium-67	Zinc-68	53:15	8,180
1-25-77	New England Nuclear	Gallium-67	Zinc-68	<u>45:55</u>	<u>7,081</u>
				220:40	\$34,776

Cyclotron Operations

The cyclotron operated 239 hours during the month of January. Operations were interrupted three times during the month for equipment repairs. On January 2, 1977 a 440 volt A.C. terminal in cubicle 96 had to be repaired. On January 9, 1977 a vacuum failure occurred due to a bad bearing on an electric motor on a Kinney pump. The electric motor was replaced, but it too had a bearing failure within 15 minutes of startup because the belts had been tightened too tight when the motor was installed. On January 12th the heating element on the east 20-inch diffusion pump was replaced. The cyclotron did not operate from January 25th through January 31st due to RF problems. Two carbon plates on the liner were found to be cracked, the bias bushing was leaking badly, and the deflector had a leak in the flexible cooling water line inside the vacuum tank.

FISSION PRODUCTS

Krypton-85 Enrichment Facility (*R. W. Schaiich*)

The ⁸⁵Kr enrichment columns operated satisfactorily during the month of January. A maintenance program was initiated in January to upgrade the operational safety of the system. This maintenance should be completed by the middle of February on 50% of the columns. At that time the remaining sections will be unloaded and a material balance for the run completed.

Cesium-137 Pilot Production (*R. W. Schaiich*)
(Production and Inventory Accounts)

1. Process Status

Process equipment is in standby status.

2. Operational Summary

Product Inventory

(Decay calculated through August 31, 1976)

<u>Inventory Material</u>	<u>Amount (Ci)</u>
Cesium-137 chloride powder	<u>34,900</u>
<u>Total Inventory Material</u>	<u>34,900</u>

<u>Non-Inventory Material</u>	<u>Amount (Ci)</u>
Special Form cans	4,500
Material returned or stored for customer	
New England Nuclear Corporation	3,400
Puerto Rico sources	8,100
Lockheed	20,100
AECL powder	73,200
Radiation Resources	19,700
Minn. Mining & Mfg. Company	6,600
Gamma Industries	8,600
<u>Total Non-Inventory Material</u>	<u>144,200</u>
TOTAL INVENTORY AND NON-INVENTORY MATERIAL	179,100

Fabrication Summary

	<u>Jan. 1977</u>		<u>CY 1977</u>		<u>FY 1977</u>	
	<u>No.</u>	<u>Ci</u>	<u>No.</u>	<u>Ci</u>	<u>No.</u>	<u>Ci</u>
Sources						
Fabricated	5	15,846	5	15,846	22	16,146
Shipped	5	15,846	5	15,846	64	30,786
Special Form Cans						
Fabricated	0	0	0	0	0	0
Shipped	2	1,900	2	1,900	2	1,900

3. Current Orders

All orders on hand have been completed and the material placed into storage awaiting receipt of release for the material.

Strontium-90 Pilot Production (*R. W. Schleich*)
(Production and Inventory Accounts)

1. Process Status

The 20,000 curie ^{90}Sr heat source that was fabricated in November, 1976 for SNAM Progetti, Italy will be encapsulated and shipped during February, 1977. Weld penetration specifications have been resolved with the customer.

Product Inventory

(Decay calculated through August 31, 1976)

<u>Inventory Material</u>	<u>Amount (Ci)</u>
⁹⁰ Sr titanate powder (±5%)	77,000
Sources in fabrication	20,000
RCA source	57,300
⁹⁰ Sr silicate powder (est.)	28,000
Stock powder cans	<u>3,790</u>
<u>Total Inventory Material</u>	<u>186,090</u>
<u>Non-Inventory Material</u>	<u>Amount (Ci)</u>
Calorimeter Standards	4,900
FPDL recovery material	19,700
Quehanna recovery material	44,000
Weather Bureau source	11,700
SNAP-7B	160,200
SNAP-7C	25,200
SNAP-7D	146,600
SNAP material purchase ^a	<u>254,500</u>
<u>Total Non-Inventory Material</u>	<u>666,800</u>
TOTAL INVENTORY AND NON-INVENTORY MATERIAL	852,890

^aStrontium-90 purchased under DRRD program.Fabrication Summary

	<u>Jan. 1977</u>		<u>CY 1977</u>		<u>FY 1977</u>	
	<u>No.</u>	<u>Ci</u>	<u>No.</u>	<u>Ci</u>	<u>No.</u>	<u>Ci</u>
Sources						
Fabricated	0	0	0	0	0	0
Shipped	0	0	0	0	0	0
Special Form Cans						
Fabricated	0	0	0	0	0	0
Shipped	0	0	0	0	0	0

Short-Lived Fission Production (*R. W. Schaiach*)
(Production and Inventory Accounts)

<u>Isotope</u>	<u>Number of Batches</u>	<u>Amount (Ci)</u>
Xenon-133	2	1100
Iodine-131	1	40
Zirconium/Niobium-95	1	14
Ruthenium-103	1	16
Strontium-89	1	39

RADIOISOTOPE SALES

J. E. Ratledge

Shipments made during the month that may be of interest are listed below:

<u>Customer</u>	<u>Isotope</u>	<u>Amount</u>
<u>Large Quantities</u>		
Schwarz/Mann	Tritium	1,000 Ci
American Atomics	Tritium	6,000 Ci
ICN Pharmaceuticals	Tritium	1,000 Ci
New England Nuclear Corporation	Tritium	4,000 Ci
Saunders-Roe, England	Tritium	10,000 Ci

Withdrawn Items

Cleveland Metropolitan General Hospital	Iodine-131	50 mCi
---	------------	--------

Items Used in Cooperative Programs

University of Southern California	Platinum-195m	12 mCi
George Washington University Medical Ctr.	Platinum-195m	30 mCi

The radioisotope sales and shipments for October 1975 through January 1976 and the first four months of fiscal year 1977 are given in Table 2.

Table 2. Radioisotope Sales and Shipments

Item	10-1-75 thru 1-31-76	10-1-76 thru 1-31-77
Inventory items	\$ 103,410	\$ 102,985
Major products	15,767	36,399
Radioisotope services	31,859	61,507
Cyclotron irradiations	54,849	165,934
Miscellaneous processed materials	19,288	18,502
Packing and Shipping	34,715	63,189
Total	\$ 259,888	\$ 448,516
Number of shipments	804	792

PUBLICATIONS

REPORTS

E. Lamb, *Radioisotope Distribution Program Progress Report for December 1976*, ORNL/TM-5791, Oak Ridge National Laboratory (January 1977).

•

•

•

•

•

•

INTERNAL DISTRIBUTION

- | | |
|----------------------|--------------------------------------|
| 1. E. E. Beauchamp | 12. M. E. Ramsey |
| 2. T. A. Butler | 13. J. E. Ratledge |
| 3. F. N. Case | 14. C. R. Richmond |
| 4. W. R. Casto | 15. R. W. Schaich |
| 5. J. A. Cox | 16. M. R. Skidmore |
| 6. R. F. Hibbs | 17. M. J. Skinner |
| 7. E. Lamb | 18-19. Central Research Library |
| 8. H. H. Nichol | 20-21. Laboratory Records Department |
| 9. C. L. Ottinger | 22. Laboratory Records - RC |
| 10. J. K. Poggenburg | 23. Document Reference Section |
| 11. H. Postma | |

EXTERNAL DISTRIBUTION

- 24. B. J. Dropesky, LASL, Los Alamos, New Mexico
- 25-26. J. H. Jarrett, PNL, Richland, Washington
- 27. D. K. Jones, Richland Operations Office, Richland, Washington
- 28. J. N. Maddox, ERDA-DBER, Washington, D.C.
- 29. H. A. O'Brien, LASL, Los Alamos, New Mexico
- 30. F. J. Skozen (Krizek), Argonne Cancer Research Hospital, Chicago
- 31. L. G. Stang, Jr., BNL, New York
- 32. W. H. Weyzen, ERDA-DBER, Washington, D.C.
- 33-34. R. W. Wood, ERDA-DBER, Washington, D.C.
- 35. Donner Laboratory Library, Univ. of California, Berkeley, Calif., 94720
- 36. Research and Technical Support Division, ORO
- 37-38. Technical Information Center