

OAK RIDGE NATIONAL LABORATORY LIBRARIES



3 4456 0551277 2



Radioisotope Distribution Program Progress Report for June 1978

E. Lamb

~~All information in this report is limited to those
listed on the distribution list and to U.S. Government agencies
and their Contractors.~~

OAK RIDGE NATIONAL LABORATORY
CENTRAL RESEARCH LIBRARY
CIRCULATION SECTION
4500N ROOM 175

LIBRARY LOAN COPY

DO NOT TRANSFER TO ANOTHER PERSON

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

JUN 29 1978

OAK RIDGE NATIONAL LABORATORY
OPERATED BY UNION CARBIDE CORPORATION · FOR THE DEPARTMENT OF ENERGY

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, contractors, subcontractors, or their employees, makes any warranty, express or implied, nor assumes any legal liability or responsibility for any third party's use or the results of such use of any information, apparatus, product or process disclosed in this report, nor represents that its use by such third party would not infringe privately owned rights.

ORNL/TM-6517

Contract No. W-7405-eng-26

OPERATIONS DIVISION

RADIOISOTOPE DISTRIBUTION PROGRAM
PROGRESS REPORT FOR JUNE 1978

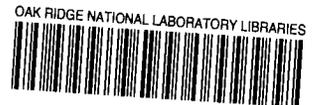
E. Lamb

Work Sponsored by
DOE Division of Biomedical and
Environmental Research

Date Published - August 1978

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
DEPARTMENT OF ENERGY



3 4456 0551277 2



CONTENTS

	<u>Page</u>
SUMMARY	1
RADIOISOTOPE PRODUCTION AND MATERIALS	1
REACTOR-PRODUCED RADIOISOTOPES.	1
Reactor Products Production	1
Iridium-192 Production.	1
Other GETR Products and Services.	1
ACCELERATOR-PRODUCED ISOTOPES	1
Cyclotron Service Irradiations.	1
FISSION PRODUCTS.	2
Krypton-85 Enrichment Facility.	2
Cesium-137 Pilot Production	2
Strontium-90 Pilot Production	4
Short-Lived Fission Product Production.	5
RADIOISOTOPE SALES.	5
PUBLICATIONS.	6
REPORTS	6

RADIOISOTOPE DISTRIBUTION PROGRAM
PROGRESS REPORT FOR JUNE 1978

E. Lamb

SUMMARY

Information is reported on new production,
inventory status, operational problems, and
radioisotope sales.

RADIOISOTOPE PRODUCTION AND MATERIALS

REACTOR-PRODUCED RADIOISOTOPES

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

<u>Processed Units</u>	
<u>Radioisotope</u>	<u>Amount (mCi)</u>
Calcium-47	22

Iridium-192 Production (*R. W. Schaich*)

Nine customer irradiation units and eight ORNL HFIR units (RB) containing 118,000 curies of ^{192}Ir at HFIR discharge date were processed during the month of June 1978. Nineteen shipments containing 98,300 curies of ^{192}Ir were made during this period.

Other GETR Products and Services (*E. Lamb*)

A test irradiation of 26.6 g of molybdenum metal pellets furnished by Medi-Physics was made in the ORR hydraulic tube. The seven-day irradiation resulted in a specific activity of 2.4 Ci/g at discharge, comparable to the 2.5 Ci/g obtained from a six-day irradiation in April 1978.

The General Electric Company submitted a request for a bid on the provision of the ^{133}Xe from one target on a batch basis each week. The estimate and background information are being prepared for transmittal to ORO.

ACCELERATOR-PRODUCED ISOTOPES

Cyclotron Service Irradiations (*M. R. Skidmore*)
(Production and Inventory Accounts)

June 1978 ORNL 86-Inch Cyclotron runs for ORNL and non-ORNL programs are given in Table 1.

Table 1. Cyclotron Irradiations and Runs for June 1978

Date	Customer	Product	Target	Total Time (hr:min)	Total Charges
<u>ORNL Programs</u>					
6- 1-78	ORAU	Nitrogen-13	Carbon-13	4:15	\$ 544
<u>Non-ORNL Programs</u>					
5- 1-78	New England Nuclear	Gold-195	Platinum	5:30	\$ 1,778
6- 3-78	New England Nuclear	Technetium-95m	Molybdenum	21:15	3,270
6- 7-78	New England Nuclear	Cobalt-57	Nickel-58	43:50	7,843
6-25-78	New England Nuclear	Gallium-67	Zinc-68	41:15	6,395
6-28-78	New England Nuclear	Cobalt-57	Nickel-58	<u>51:15</u>	<u>8,969</u>
				163:05	\$28,255

During the month of June, the cyclotron operated a total of 164 hours. A cobalt run was interrupted on June 7th due to RF instabilities. Several cracks were found in the liner, the accelerating electrode was broken, and a loose lip carbon was found. The dees were removed, the liner welded, other necessary repairs made, and the dees reinstalled on June 17th. Operations were resumed on June 23rd. On June 29th, the Y-12 utilities department closed a valve on the 300 HP recirculating magnet cooling oil pump without turning the motor off, resulting in severe damage to the pump.

FISSION PRODUCTS

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

The south bank of the ^{85}Kr Thermal Diffusion Columns has operated according to design since April, 1978. The tentative schedule calls for unloading the south bank in July. The north bank was emptied and leak tested during the month of May, 1978. Major repairs were required on the north bank due to leakage on the end welds of approximately 25% of the calrods. This work has been completed and the north bank was checked out, loaded, and placed in operation.

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

1. Process Status

The ^{137}Cs processing equipment has been placed in standby status.

2. Operational Summary

Product Inventory

(Decay calculated through August 31, 1977)

<u>Inventory Material</u>	<u>Amount (Ci)</u>
Cesium-137 chloride powder	<u>29,680</u>
<u>Total Inventory Material</u>	<u>29,680</u>
<u>Non-Inventory Material</u>	<u>Amount (Ci)</u>
Special Form Cans	4,200
Material returned or stored for customer	
Nuclear Research Corporation	0
J. L. Shepherd	26,500
New England Nuclear Corporation	2,100
Puerto Rico Sources	7,900
Lockheed	19,600
AECL powder	38,100
Radiation Resources	19,800
Minn. Mining & Mfg. Company	0
Gamma Industries	<u>8,400</u>
<u>Total Non-Inventory Material</u>	<u>126,600</u>
TOTAL INVENTORY AND NON-INVENTORY MATERIAL	156,280

Fabrication Summary

	<u>June 1978</u>		<u>CY 1978</u>		<u>FY 1978</u>	
	<u>No.</u>	<u>Ci</u>	<u>No.</u>	<u>Ci</u>	<u>No.</u>	<u>Ci</u>
Sources						
Fabricated	0	0	40	76,105	40	76,105
Shipped	1	5	33	57,630	32	57,630
Special Form Cans						
Fabricated	0	0	0	0	1	5
Shipped	0	0	7	2,400	11	2,600

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. Schaich)
(Production and Inventory Accounts)

1. Process Status

The ⁹⁰Sr source fabrication equipment has been placed in standby status.

Product Inventory

(Decay calculated through August 31, 1977)

<u>Inventory Material</u>	<u>Amount (Ci)</u>
⁹⁰ Sr titanate powder (±5%)	0
Sources in fabrication	0
Stock powder cans	3,070
Stock solution	<u>200</u>
<u>Total Inventory Material</u>	<u>3,270</u>
<u>Non-Inventory Material</u>	<u>Amount (Ci)</u>
New England Nuclear Corporation	225
Batch 26Sr-74RE	7,900
Calorimeter Standards	4,800
Weather Bureau Source	11,400
SNAP-7B	156,300
SNAP-7C	24,600
SNAP-7D	143,000
SNAP material purchase ^a	248,300
AGN-4 Powder	<u>38,400</u>
<u>Total Non-Inventory Material</u>	<u>634,925</u>
<u>TOTAL INVENTORY AND NON-INVENTORY MATERIAL</u>	<u>638,195</u>

^aStrontium-90 purchased under DRRD program.

Fabrication Summary

	<u>June 1978</u>		<u>CY 1978</u>		<u>FY 1978</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	6	40	6	40
Shipped	1	25	2	30	2	30

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

The production of short-lived fission products is listed in the table below.

<u>Isotope</u>	<u>Number of Batches</u>	<u>Amount (Ci)</u>
Iodine-131	1	100
Xenon-133	5	3350

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>		
Radiochemical Centre, Ltd., England	Tritium	90,000 Ci
New England Nuclear Corporation	Tritium	10,000 Ci
Self-Powered Lighting, Ltd.	Tritium	8,000 Ci
Brandhurst Company, Ltd., England	Tritium	15,000 Ci
American Atomics Corporation	Tritium	150,000 Ci
U.S. Radium Corporation	Tritium	15,000 Ci
Radium-Chemie, Ltd., Switzerland	Tritium	30,000 Ci
Saunders-Roe Developments, England	Tritium	30,000 Ci
<u>Withdrawn Items</u>		
Automation Industries, Inc.	Iridium-192	19,629 Ci
Gulf Nuclear	Iridium-192	10,396 Ci
Source Production and Equipment Co.	Iridium-192	6,193 Ci
Technical Operations	Iridium-192	28,665 Ci
Industrial Nuclear Company	Iridium-192	2,642 Ci
Gamma Industries	Iridium-192	30,760 Ci
New England Nuclear Corporation	Nickel-63	1,600 mCi
<u>Items Used in Cooperative Programs</u>		
National Institutes of Health	Potassium-43	8 mCi
V.A. Center, Wood, Wisconsin	Potassium-43	7 mCi
V.A. Hospital, Lexington, Kentucky	Platinum-195m	20 mCi
University of Arizona	Platinum-195m	~6 mCi

The radioisotope sales and shipments for the first eight months of fiscal year 1977 and fiscal year 1978 are given in Table 2.

Table 2. Radioisotope Sales and Shipments

Item	10-1-76 thru 6-30-77	10-1-77 thru 6-30-78
Inventory items	\$ 304,279	\$ 104,086
Tritium		1,278,480
Major Products	85,744	425,877
Iridium-192		742,253
Radioisotope Services	150,634	217,280
Cyclotron Irradiations	170,551	217,210
Miscellaneous Processed Materials	35,968	161,006
Packing and Shipping	145,969	163,750
Total	\$ 893,145	\$3,309,942
Number of Shipments	1,840	1,965

PUBLICATIONS

REPORTS

E. Lamb, *Radioisotope Distribution Program Progress Report for May 1978*, ORNL/TM-6460, Oak Ridge National Laboratory (July 1978).

INTERNAL DISTRIBUTION

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

EXTERNAL DISTRIBUTION

- 22. B. J. Dropesky, LASL, Los Alamos, New Mexico
- 23-24. J. H. Jarrett, PNL, Richland, Washington
- 25. D. K. Jones, Richland Operations Office, Richland, Washington
- 26. J. N. Maddox, DOE-DBER, Washington, D.C.
- 27. H. A. O'Brien, LASL, Los Alamos, New Mexico
- 28. F. J. Skozen (Krizek), Argonne Cancer Research Hospital, Chicago
- 29. L. G. Stang, Jr., BNL, New York
- 30. W. H. Weyzen, DOE-DBER, Washington, D.C.
- 31-32. R. W. Wood, DOE-DBER, Washington, D.C.
- 33. Donner Laboratory Library, Univ. of California, Berkely, Calif., 94720
- 34. Research and Technical Support Division, ORO
- 35-36. Technical Information Center