

OAK RIDGE NATIONAL LABORATORY LIBRARIES



3 4456 0555756 3

ORNL/TM-6080

cy. 18

Radioisotope Distribution Program Progress Report for August 1977

E. Lamb

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 AUGUST 1977

E. Lamb

Work Sponsored by
Department of Energy
Division of Biomedical and Environmental Research

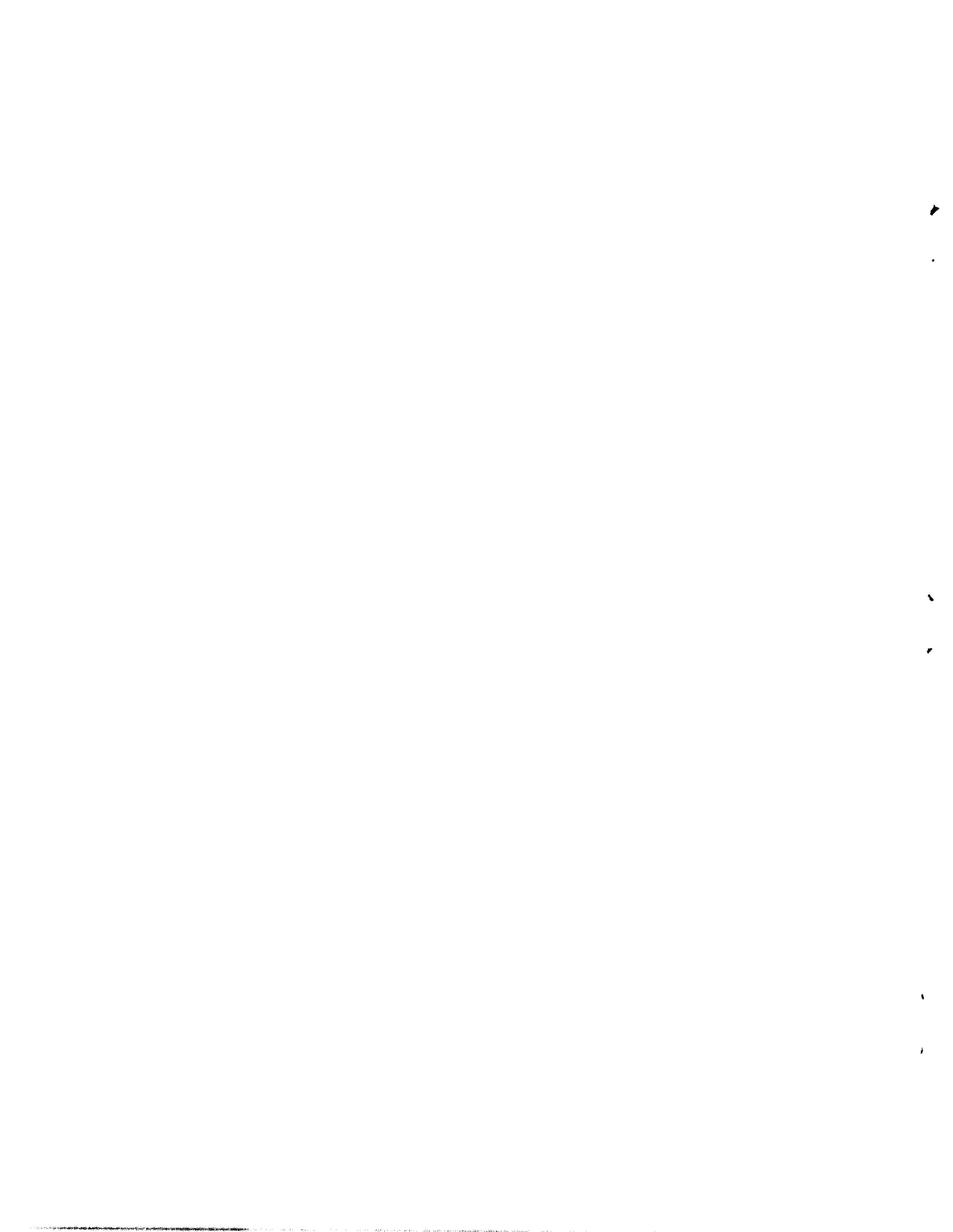
Date Published - October 1977

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
DEPARTMENT OF ENERGY



3 4456 0555756 3



CONTENTS

	<u>Page</u>
SUMMARY.	1
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 AUGUST 1977

E. Lamb

SUMMARY

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

RADIOISOTOPE PRODUCTION AND MATERIALS DEVELOPMENT

REACTOR-PRODUCED RADIOISOTOPES

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

Processed Units	
Radioisotope	Amount (mCi)
Calcium-47	20

ACCELERATOR-PRODUCED ISOTOPES

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

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

Table 1. Cyclotron Irradiations and Runs for August 1977

Date	Customer	Product	Target	Total Time (hr:min)	Total Charges
<u>ORNL Programs</u>					
8-17-77	ORAU	Carbon-11	Boron Oxide	5:20	\$ 639
8-24-77	ORAU	Carbon-11	Boron Oxide	5:40	678
				11:00	\$ 1,317
<u>Non-ORNL Programs</u>					
8- 1-77	New England Nuclear	Gallium-67	Zinc-68	25:15	\$ 3,980
8- 3-77	New England Nuclear	Germanium-68	Gallium	15:15	2,579
8- 6-77	New England Nuclear	Germanium-68	Gallium	15:15	2,579
8- 8-77	New England Nuclear	Gallium-67	Zinc-68	25:15	3,980
8-11-77	ICN Pharmaceuticals	Cobalt-57	Nickel-58	49:15	9,735
8-16-77	New England Nuclear	Gallium-67	Zinc-68	57:15	8,780
8-18-77	New England Nuclear	Gallium-67	Zinc-68	11:15	1,880
8-22-77	New England Nuclear	Gallium-67	Zinc-68	25:15	3,980
8-23-77	ICN Pharmaceuticals	Cobalt-56	Iron-56	6:15	1,280
8-25-77	ICN Pharmaceuticals	Arsenic-74	Germanium	13:15	2,367
8-27-77	New England Nuclear	Germanium-68	Gallium	15:15	2,579
				258:45	\$43,719

Cyclotron Operations

During the month of August the cyclotron operated a total of 270 hours. One run was interrupted and the startup of another was delayed by shorted capacitors in the filament coupling line of the RF system. The refrigeration compressor which provides cooling to the diffusion pump baffles failed twice during the month with a consequent high pressure in the cyclotron for about an hour each time. A backup system to alleviate the compressor failure problem has been discussed with a Y-12 refrigeration engineer.

No operations were scheduled August 26th due to a request by Y-12 personnel for a power outage to change an electrical breaker in the building. A short delay to the start of a ^{67}Ga production run was caused by maintenance work on a lighting panel which was left disconnected over a weekend. An additional delay on the same occasion was caused by maintenance personnel breaking the instrument air line serving the pneumatic valve controlling the cyclotron cooling water and closing a valve on the line without notifying cyclotron personnel. A failure of the d.c. generator for the magnetic field in the cyclotron was found to be caused by the malfunction of a small 110-volt relay in new high voltage switch gear serving the building in which the cyclotron is located.

FISSION PRODUCTS

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

Five of the ^{85}Kr enrichment columns were operating during the month of August and all the units were functioning according to design. The south bank of three columns are scheduled to be unloaded during September, 1977. Expected yield on one of these columns should be >20% enrichment in ^{85}Kr . One column in the north bank was shut down due to an electrical overload in the chilled water compressor system. The wiring and switch boxes will require major modifications to allow all six columns to operate at 100% efficiency.

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>32,250</u>
<u>Total Inventory Material</u>	<u>32,250</u>

<u>Non-Inventory Material</u>	<u>Amount (Ci)</u>
Special Form Cans	4,300
Material returned or stored for customer	
Nuclear Research Corporation	900
J. L. Shepherd	50,600
New England Nuclear Corporation	2,700
Puerto Rico Sources	7,900
Lockheed	19,600
AECL powder	71,500
Radiation Resources	19,800
Minn. Mining & Mfg. Company	2,800
Gamma Industries	8,400
<u>Total Non-Inventory Material</u>	<u>188,500</u>
TOTAL INVENTORY AND NON-INVENTORY MATERIAL	220,750

Fabrication Summary

	<u>Aug. 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	5	15,846	22	16,146
Shipped	0	0	8	34,475	67	49,413
Special Form Cans						
Fabricated	0	0	0	0	0	0
Shipped	0	0	12	5,450	12	5,450

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 fabrication of three ⁹⁰Sr heat sources for Sentinel-8 generators (Teledyne Energy Systems) was completed. Generator loading is scheduled for September 1, 1977.

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	157,100
Stock powder cans	3,325
Stock solution	200
<u>Total Inventory Material</u>	<u>160,625</u>

<u>Non-Inventory Material</u>	<u>Amount (Ci)</u>
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	<u>38,400</u>
<u>Total Non-Inventory Material</u>	<u>634,700</u>
 TOTAL INVENTORY AND NON-INVENTORY MATERIAL	 795,325

^aStrontium-90 purchased under DRRD program.

Fabrication Summary

	<u>Aug. 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	1	20,000	1	20,000
Special Form Cans						
Fabricated	0	0	0	0	0	0
Shipped	0	0	2	20	2	20

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

<u>Isotope</u>	<u>Number of Batches</u>	<u>Amount (Ci)</u>
Xenon-133	2	1190

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>		
New England Nuclear Corporation	Tritium	14,000 Ci
American Atomics Corporation	Tritium	15,000 Ci
Brookhaven National Laboratory	Tritium	1,500 Ci
ICN Pharmaceuticals	Tritium	1,000 Ci
U.S. Radium Corporation	Tritium	10,000 Ci

<u>Customer</u>	<u>Isotope</u>	<u>Amount</u>
<u>Withdrawn Items</u>		
Westinghouse Electric Company	Iodine-131	5 mCi
Mine Safety Appliances Company	Iodine-131	120 mCi
<u>Items Used in Cooperative Programs</u>		
University of Southern California	Platinum-195m	17 mCi

The radioisotope sales and shipments for October 1975 through August 1976 and the first 11 months of fiscal year 1977 are given in Table 2.

Table 2. Radioisotope Sales and Shipments

<u>Item</u>	<u>10-1-75 thru</u> <u>8-31-76</u>	<u>10-1-76 thru</u> <u>8-31-77</u>
Inventory items	\$ 303,473	\$ 402,417
Major products	61,006	100,291
Radioisotope services	122,350	178,970
Cyclotron irradiations	217,874	266,388
Miscellaneous processed materials	82,814	91,101
Packing and Shipping	<u>123,447</u>	<u>175,274</u>
Total	\$ 910,964	\$ 1,214,441
Number of shipments	1,655	2,202

PUBLICATIONS

REPORTS

E. Lamb, *Radioisotope Distribution Program Progress Report for July 1977*, ORNL/TM-6031, Oak Ridge National Laboratory (August 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