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**Radioisotope Distribution Program  
Progress Report for December 1976**

E. Lamb

**OAK RIDGE NATIONAL LABORATORY**

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

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OPERATIONS DIVISION

RADIOISOTOPE DISTRIBUTION PROGRAM  
PROGRESS REPORT FOR DECEMBER 1976

E. Lamb

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RADIOISOTOPE DISTRIBUTION PROGRAM  
PROGRESS REPORT FOR DECEMBER 1976

*E. Lamb*

RADIOISOTOPE PRODUCTION AND MATERIALS DEVELOPMENT  
REACTOR-PRODUCED RADIOISOTOPES

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

Processed Units	
Radioisotope	Amount (mCi)
Calcium-47	17

ACCELERATOR-PRODUCED ISOTOPES

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

December 1976 ORNL 86-Inch Cyclotron runs for ORNL and non-ORNL programs are given in Table 1.

Table 1. Cyclotron Irradiations and Runs for December 1976

Date	Customer	Product	Target	Total Time	Total Charges
<u>ORNL Programs</u>					
None					
<u>Non-ORNL Programs</u>					
12-10-76	New England Nuclear	Gallium-67	Zinc-68	14:15	\$ 2,330
12-14-76	New England Nuclear	Gallium-67	Zinc-68	53:15	8,180
12-16-76	New England Nuclear	Cobalt-57	Nickel-58	46:30	8,402
12-21-76	New England Nuclear	Gallium-67	Zinc-68	48:15	7,430
12-22-76	New England Nuclear	Germanium-68	Gallium	13:15	2,279
12-28-76	New England Nuclear	Callium-67	Zinc-68	50:15	7,730
				225:45	\$36,251

### Cyclotron Operations

During the month of December the cyclotron operated a total of 220 hours. Two runs were interrupted due to equipment failure, with one of the runs being completed on schedule. On December 1, 1976 we were unable to apply the RF to the dees. Sparking was noted from the south dee to the south-east liner wall. The cyclotron was let down to air and a crack in the liner was detected by visual inspection. The dees were removed and the crack in the liner was welded. The repairs were completed December 8, 1976 and operations were resumed. A short outage occurred December 16, 1976 due to a shorted coupling capacitor in the oscillator system.

### FISSION PRODUCTS

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

The  $^{85}\text{Kr}$  enrichment columns operated satisfactorily during the month of December. Unloading operations were completed on 50% of the system during December. Analyses of the products were incomplete at the time of this report. A one-month maintenance period will be initiated on the columns that were unloaded. At the end of this period the second half of the system will be unloaded and the products analyzed.

#### Cesium-137 Pilot Production (*R. W. Schaich*) (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>36,500</u>
<u>Total Inventory Material</u>	<u>36,500</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	8,500
Gamma Industries	8,600
J. L. Shepherd	<u>14,100</u>
<b>Total Non-Inventory Material</b>	<b>160,200</b>
<b>TOTAL INVENTORY AND NON-INVENTORY MATERIAL</b>	<b>196,700</b>

#### Fabrication Summary

	Dec. 1976		CY 1976		FY 1977	
	No.	Ci	No.	Ci	No.	Ci
<b>Sources</b>						
Fabricated	2	10	10	3,300	17	300
Shipped	44	14,650	61	17,940	59	14,940
<b>Special Form Cans</b>						
Fabricated	0	0	42	4,200	0	0
Shipped	0	0	11	1,720	0	0

### 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 20,000 curie <sup>90</sup>Sr heat source that was fabricated in November, 1976 for SNAM Progetti, Italy has been delayed until agreement can be reached on the weld penetration for the outer capsule.

Product Inventory

(Decay calculated through August 31, 1976)

<u>Inventory Material</u>	<u>Amount (Ci)</u>
<sup>90</sup> Sr titanate powder ( $\pm 5\%$ )	77,000
Sources in fabrication	20,000
RCA source	57,300
<sup>90</sup> 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 <sup>a</sup>	<u>254,500</u>
<u>Total Non-Inventory Material</u>	<u>666,800</u>
<b>TOTAL INVENTORY AND NON-INVENTORY MATERIAL</b>	<b>852,890</b>

<sup>a</sup>Strontium-90 purchased under DRRD program.Fabrication Summary

	Dec. 1976		CY 1976		FY 1977	
	No.	Ci	No.	Ci	No.	Ci
<b>Sources</b>						
Fabricated	0	0	3	343,800	0	0
Shipped	0	0	3	343,800	0	0
<b>Special Form Cans</b>						
Fabricated	0	0	0	0	0	0
Shipped	0	0	7	344	1	10

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

<u>Isotope</u>	<u>Number of Batches</u>	<u>Amount (Ci)</u>
Xenon-133	4	2600
Iodine-131	1	18
Niobium-95	1	2
Yttrium-91	1	2

## 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>
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Large Quantities

Saunders-Roe, England	Tritium	5,000 Ci
New England Nuclear Corporation	Tritium	8,000 Ci
American Atomics	Tritium	6,000 Ci
Self-Powered Lighting, Ltd.	Tritium	2,000 Ci
KMS Fusion, Inc.	Tritium	1,001 Ci
ICN Pharmaceuticals	Tritium	1,000 Ci

Withdrawn Items

Cleveland Metropolitan General Hospital	Iodine-131	50 mCi
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Items Used in Cooperative Programs

University of Southern California	Platinum-195m	30 mCi
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The radioisotope sales and shipments for the last three months of 1975 and the first three months of fiscal year 1977 are given in Table 2.

Table 2. Radioisotope Sales and Shipments

Item	10-1-75 thru 12-31-75	10-1-76 thru 12-31-76
Inventory items	\$ 83,694	\$ 71,013
Major products	10,045	27,154
Radioisotope services	23,570	57,688
Cyclotron irradiations	54,699	116,842
Miscellaneous processed materials	15,609	20,039
Packing and shipping	25,395	47,634
Total	\$ 213,012	\$ 340,370
Number of shipments	685	602

## PUBLICATIONS

## REPORTS

E. Lamb, *Radioisotope Distribution Program Progress Report for November 1976*, ORNL/TM-5748, Oak Ridge National Laboratory (December 1976).

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