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# Radioisotope Distribution Program Progress Report for June 1975

E. Lamb



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OPERATIONS DIVISION

RADIOISOTOPE DISTRIBUTION PROGRAM  
PROGRESS REPORT FOR JUNE 1975

E. Lamb

Work Sponsored by  
ERDA Division of Biomedical and  
Environmental Research

AUGUST 1975

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RADIOISOTOPE DISTRIBUTION PROGRAM  
PROGRESS REPORT FOR JUNE 1975

*E. Lamb*

RADIOISOTOPE PRODUCTION AND MATERIALS DEVELOPMENT

REACTOR-PRODUCED RADIOISOTOPES

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

<u>Processed Units</u>	
<u>Radioisotope</u>	<u>Amount (mCi)</u>
Calcium-47	17

ACCELERATOR-PRODUCED ISOTOPES

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

June 1975 ORNL 86-Inch Cyclotron runs for ORNL and non-ORNL programs are given in Table 1.

Table 1. Cyclotron Irradiations and Runs for June 1975

Date	Customer	Product	Target	Total Time (hr:min)	Total Charges
<u>ORNL Programs</u>					
6-3-75	ORAU	Carbon-11	Boron Oxide	2:50	\$ 276
6-6-75	ORAU	Carbon-11	Boron Oxide	2:25	234
6-12-75	ORAU	Carbon-11	Boron Oxide	<u>3:45</u>	<u>363</u>
				9:00	\$ 873
<u>Non-ORNL Programs</u>					
6-10-75	EPA, Las Vegas	Neptunium-234	Uranium-235	2:15	\$ 575
6-11-75	New England Nuclear Corporation	Gallium-67	Zinc-68	21:15	3,115
6-18-75	New England Nuclear Corporation	Gallium-67	Zinc-68	21:15	3,115
6-23-75	New England Nuclear Corporation	Cadmium-109	Silver	17:15	2,425
6-27-75	New England Nuclear Corporation	Cobalt-57	Nickel-58	<u>51:15</u>	<u>8,404</u>
				113:15	\$17,634

### Cyclotron Operations

Two twenty-hour irradiations were made using  $^{68}\text{Zn}$  on copper flat plates to produce  $^{67}\text{Ga}$ . Target No. 1 ran at an average beam current of 504  $\mu\text{A/hr}$  and the reported end of bombardment total yield was 22.2 Ci  $^{67}\text{Ga}$  or 2.2  $\mu\text{Ci}/\mu\text{A-hr}$  for a production rate of 1109 mCi/hr. Target No. 2 ran at an average beam current of 506  $\mu\text{A/hr}$  and the reported EOB total yield was 23.3 Ci or 2.3  $\mu\text{Ci}/\mu\text{A-hr}$  for a production rate of 1167 mCi/hr.

### FISSION PRODUCTS

#### Krypton-85 Enrichment Facility (*F. N. Case*)

Two gas samples have been taken since the initial charge of 1548 curies of 4.8%  $^{85}\text{Kr}$ . The results of the first sample, taken June 18, 1975 from column "C", and the second sample, taken July 10, 1975 from column "AB", are given below.

<u>June 18, 1975 Column C</u>		<u>July 10, 1975 Column AB</u>	
<u>Kr Mass</u>	<u>% Kr</u>	<u>Kr Mass</u>	<u>% Kr</u>
80	0.06	80	0.02
82	1.02	82	1.16
83	11.15	83	13.90
84	36.25	84	46.57
85	4.84	85	5.25
86	46.68	86	33.10

On June 27, 1975, the water level in the cooling tower got too low causing a three hour shutdown of the columns. The problem was traced to water leakage following unscheduled servicing of the cooling tower. In order to prevent a re-occurrence the maintenance crew has been instructed not to service the cooling tower unless they have been instructed to do so and have given notification of their arrival at the site.

All of the alarm systems and automatic protection devices performed normally and the system was returned to normal operation.

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

##### 1. Process Status

The  $^{137}\text{Cs}$  process equipment is in standby condition.

## 2. Operational Summary

Product Inventory

(Decay calculated through April 30, 1975)

<u>Inventory Material</u>	<u>Amount (Ci)</u>
Cesium-137 chloride powder	0
Special form cans	<u>5,070</u>
<u>Total Inventory Material</u>	<u>5,070</u>
<u>Non-Inventory Material</u>	
Material returned or stored for customer	
Puerto Rico sources	8,400
Lockheed	27,600
AECL powder	92,000
Radiation Resources	35,900
Minn. Mining & Mfg. Company	13,700
Gamma Industries	8,800
J. L. Shepherd	<u>19,800</u>
<u>Total Non-Inventory Material</u>	<u>206,200</u>
TOTAL INVENTORY AND NON-INVENTORY MATERIAL	211,270

Fabrication Summary

	<u>June 1975</u>		<u>CY 1975</u>		<u>FY 1975</u>	
	<u>No.</u>	<u>Ci</u>	<u>No.</u>	<u>Ci</u>	<u>No.</u>	<u>Ci</u>
Sources						
Fabricated	16	8,003	29	8,374	54	40,466
Shipped	16	8,003	29	8,374	54	40,466
Special Form Cans						
Fabricated	0	0	0	0	23	37,710
Shipped	1	32	5	2,081	11	4,201

## 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 <sup>90</sup>Sr process and manipulator cells are being decontaminated under the DWMT Decommission Program. The <sup>90</sup>Sr powder was removed from the FPDL, encapsulated, and stored for future orders.

Product Inventory

(Decay calculated through April 30, 1975)

<u>Inventory Material</u>	<u>Amount (Ci)</u>
<sup>90</sup> Sr titanate powder (±5%)	491,800
Sources in fabrication	0
RCA source	59,200
<sup>90</sup> Sr silicate powder	28,900
Stock powder cans	<u>4,680</u>
<u>Total Inventory Material</u>	<u>584,580</u>

<u>Non-Inventory Material</u>	<u>Amount (Ci)</u>
FPDL recovery material	18,700
Quehanna recovery material	45,500
Weather Bureau source	12,100
SNAP-7B	165,600
SNAP-7C	26,000
SNAP-7D	151,500
SNAP material purchase <sup>a</sup>	<u>263,000</u>
<u>Total Non-Inventory Material</u>	<u>682,400</u>

TOTAL INVENTORY AND NON-INVENTORY MATERIAL	1,266,980
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<sup>a</sup>Strontium-90 purchased under DRRD program.Fabrication Summary

	<u>June 1975</u>		<u>CY 1975</u>		<u>FY 1975</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	2	20	2	20	5	560

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	2	700
Iodine-131	2	80
Zirconium-95/Niobium-95	1	22
Ruthenium-103	1	46

## 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>		
Donald W. Douglas Laboratories	Promethium-147	100,001 Ci
J. L. Shepherd & Associates	Cesium-137	8,003 Ci
Self-Powered Lighting Limited	Tritium	2,000 Ci
New England Nuclear Corporation	Tritium	4,000 Ci
ICN Pharmaceuticals, Inc.	Tritium	1,000 Ci
Saunders-Roe Development Limited	Tritium	5,000 Ci
<u>Withdrawn Items</u>		
University of Rochester	Iodine-131	150 mCi
Cleveland Metropolitan General Hospital	Iodine-131	150 mCi
<u>Items Used in Cooperative Programs</u>		
ORAU	Erbium-171	140 mCi
University of California, San Francisco	Gadolinium-153	10 Ci
University of Texas Medical Branch	Potassium-43	14.8 mCi
Yale-New Haven Medical Center	Potassium-43	15.3 mCi
University of Mississippi Medical Center	Potassium-43	14.7 mCi
Johns Hopkins Medical Institutions	Potassium-43	16.4 mCi

The total radioisotopes sales proceeds and shipments for FY 1974 and FY 1975 are given in Table 2.

Table 2. Radioisotope Sales and Shipments

<u>Item</u>	<u>7-1-73 thru 6-30-74</u>	<u>7-1-74 thru 6-30-75</u>
Inventory items	\$ 467,424	\$ 409,413
Major products	65,945	97,345
Radioisotope services	297,898	120,306
Cyclotron irradiations	108,346	100,944
Miscellaneous processed materials	72,614	134,632
Packing and Shipping	74,522	75,380
Total	\$1,086,749	\$ 938,020
Number of shipments	1,805	1,592

## PUBLICATIONS

## REPORTS

J. H. Gillette, *Radioisotope Distribution Program Progress Report for May 1975*, ORNL-TM-4991, Oak Ridge National Laboratory (June 1975).

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