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Radioisotope Distribution Program Progress Report for September 1975

E. Lamb



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OPERATIONS DIVISION

RADIOISOTOPE DISTRIBUTION PROGRAM
PROGRESS REPORT FOR SEPTEMBER 1975

E. Lamb

Work Sponsored by
ERDA Division of Biomedical and
Environmental Research

DECEMBER 1975

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RADIOISOTOPE DISTRIBUTION PROGRAM
PROGRESS REPORT FOR SEPTEMBER 1975

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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	15

ACCELERATOR-PRODUCED ISOTOPES

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

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

Table 1. Cyclotron Irradiations and Runs for September 1975

Date	Customer	Product	Target	Total Time (hr:min)	Total Charges
<u>ORNL Programs</u>					
9-17-75	ORAU	Carbon-11	Boron Oxide	5:45	\$ 553
9-25-75	ORAU	Carbon-11	Boron Oxide	7:30	720
				13:15	\$ 1,273
<u>Non-ORNL Programs</u>					
11-20-72	New England Nuclear Corporation	Bismuth-207	Lead	9:15	\$ 1,498
9-22-75	New England Nuclear Corporation	Cobalt-57	Nickel-58	51:15	8,601
9-27-75	New England Nuclear Corporation	Cadmium-109	Silver	17:15	2,425
9-30-75	ICN Pharmaceutical	Yttrium-88	Strontium Carbonate	9:15	1,380
				87:00	\$13,904

Cyclotron Operations

Repairs and alterations on the cyclotron were completed September 5, 1975. Beam location targets were run and service irradiations were commenced on the backlog of orders.

FISSION PRODUCTS

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

The krypton-85 thermal diffusion plant achieved 100% operation during the period and adjustment of the gas position in the columns prior to first cycle discharge of product was completed. The CD group of columns was sampled following this peak position adjustment. This sample assayed 11.8% krypton-85. Some additional minor positioning should maximize the peak to greater than 12%. The operation of the plant is meeting design criteria and the cycle times and enrichments are near predicted values. We anticipate that approximately 2100 curies of greater than 12% krypton-85 will be withdrawn during the early part of October, of which 200 curies will be available for sales, and approximately 1900 curies will be used for second cycle feed. The second cycle should be completed in March, 1976, to yield approximately 1000 curies of 20-26% product.

During the October shutdown, maintenance on radiation monitoring stations used for process control will be made and controls on the cooling system water will be modified to provide for additional operation reliability.

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

1. Process Status

The ^{137}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>5,000</u>
<u>Total Inventory Material</u>	<u>5,000</u>

<u>Non-Inventory Material</u>	<u>Amount (Ci)</u>
Material returned or stored for customer	
Puerto Rico sources	8,400
Lockheed	27,600
AECL powder	72,000
Radiation Resources	35,900
Minn. Mining & Mfg. Company	11,700
Gamma Industries	8,800
J. L. Shepherd	<u>19,800</u>
<u>Total Non-Inventory Material</u>	<u>184,200</u>
TOTAL INVENTORY AND NON-INVENTORY MATERIAL	189,200

Fabrication Summary

	<u>Sept. 1975</u>		<u>CY 1975</u>		<u>FY 1976</u>	
	<u>No.</u>	<u>Ci</u>	<u>No.</u>	<u>Ci</u>	<u>No.</u>	<u>Ci</u>
Sources						
Fabricated	11	20,009	40	28,383	11	20,009
Shipped	11	20,009	40	28,383	11	20,009
Special Form Cans						
Fabricated	0	0	0	0	0	0
Shipped	5	2,070	10	4,151	5	2,070

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 ^{90}Sr process and manipulator cells are being decontaminated under the DWMT Decommission Program. The ^{90}Sr powder was removed from the FPD, encapsulated, and stored for future orders.

Product Inventory

(Decay calculated through April 30, 1975)

<u>Inventory Material</u>	<u>Amount (Ci)</u>
^{90}Sr titanate powder ($\pm 5\%$)	491,800
Sources in fabrication	0
RCA source	59,200
^{90}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 ^a	<u>263,000</u>
<u>Total Non-Inventory Material</u>	<u>682,400</u>
 TOTAL INVENTORY AND NON-INVENTORY MATERIAL	 1,266,980

^aStrontium-90 purchased under DRRD program.

Fabrication Summary

	<u>Sept. 1975</u>		<u>CY 1975</u>		<u>FY 1976</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	2	20	0	0

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	700
Barium/Lanthanum-140	1	1
Cerium-141/144	1	7

RADIOISOTOPE SALES

J. E. Ratledge

An inquiry was received from Japan Radioisotope Association requesting 500,000 Ci of tritium and 500 Ci of enriched ⁸⁵Kr. A request was also received from New England Nuclear Corporation for 200 Ci of ⁹⁰Sr as silicate beads.

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	8,000 Ci
U. S. Radium Corporation	Tritium	10,000 Ci
ICN Pharmaceuticals	Tritium	1,000 Ci
University of California, LLL	Tritium Targets	3,779 Ci
Government of India	Promethium-147	1,312 Ci
Atomic Energy of Canada, Ltd.	Cesium-137	20,009 Ci
<u>Withdrawn Items</u>		
National Animal Disease Center	Iodine-131	50 mCi
Cleveland General Hospital	Iodine-131	50 mCi
Rutgers University	Carbon-14	0.32 mCi
<u>Items Used in Cooperative Programs</u>		
ORAU	Dysprosium-157	50 mCi
ORAU	Erbium-171	315 mCi
University of Southern California	Platinum-195m	26 mCi

The radioisotope sales and shipments for the first three months of FY 1975 and FY 1976 are given in Table 2.

Table 2. Radioisotope Sales and Shipments

Item	7-1-74 thru 9-30-74	7-1-75 thru 9-30-75
Inventory items	\$ 115,417	\$ 65,814
Major products	12,330	11,488
Radioisotope services	27,109	31,757
Cyclotron irradiations	19,691	24,880
Miscellaneous Processed Materials	19,784	13,984
Packing and Shipping	<u>19,060</u>	<u>19,803</u>
Total	\$ 213,391	\$ 167,726
Number of shipments	387	150

PUBLICATIONS

REPORTS

E. Lamb, *Radioisotope Distribution Program Progress Report for August 1975*, ORNL-TM-5119, Oak Ridge National Laboratory (September 1975).



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