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(**Radioisotope Distribution Program
Progress Report for September 1976**)

(E. Lamb) A

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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 SEPTEMBER 1976

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E. Lamb

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OAK RIDGE NATIONAL LABORATORY
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operated by
UNION CARBIDE CORPORATION
for the
ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

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RADIOISOTOPE DISTRIBUTION PROGRAM
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RADIOISOTOPE PRODUCTION AND MATERIALS DEVELOPMENT

REACTOR-PRODUCED RADIOISOTOPES

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

<u>Processed Units</u>	
<u>Radioisotope</u>	<u>Amount (mCi)</u>
Calcium-47	20
Copper-67	9.5

ACCELERATOR-PRODUCED ISOTOPES

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

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

Table 1. Cyclotron Irradiations and Runs for September 1976

<u>Date</u>	<u>Customer</u>	<u>Product</u>	<u>Target</u>	<u>Total Time (hr:min)</u>	<u>Total Charges</u>
<u>ORNL Programs</u>					
9- 1-76	ORAU	Carbon-11	Boron Oxide	5:45	\$ 688
9- 9-76	ORAU	Carbon-11	Boron Oxide	5:40	678
9-15-76	ORAU	Carbon-11	Boron Oxide	6:10	735
9-29-76	ORAU	Carbon-11	Boron Oxide	5:10	720
				22:45	\$ 2,721
<u>Non-ORNL Programs</u>					
9-14-76	New England Nuclear	Gold-195	Platinum	11:15	\$ 2,312
9- 1-76	Harvard University	Tungsten-181	Tantalum	3:15	590
9- 7-76	New England Nuclear	Gallium-67	Zinc-68	29:15	4,580
9-14-76	New England Nuclear	Gallium-67	Zinc-68	35:15	5,480
9-17-76	EPA, Las Vegas, Nev.	Neptunium-234	Uranium-235	23:15	4,140
9-21-76	New England Nuclear	Gallium-67	Zinc-68	30:15	4,730
9-28-76	New England Nuclear	Gallium-67	Zinc-68	34:15	5,330
				166:45	\$27,162

Cyclotron Operations

In addition to normal routine maintenance, the following repairs were made: Replaced a defective motorized valve on one of the diffusion pumps, repaired a cubicle, and repaired the capsule dolly.

FISSION PRODUCTS

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

The ⁸⁵Kr enrichment columns operated satisfactorily during the month September. Unloading operations will be initiated after the installation of a new unloading station. This station is being designed and should be in operation by October 1976. Design changes and operational approvals have delayed the unloading schedule.

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>36,860</u>
<u>Total Inventory Material</u>	<u>36,860</u>
<u>Non-Inventory Material</u>	<u>Amount (Ci)</u>
Special Form cans	4,500
<u>Material returned or stored for customer</u>	
New England Nuclear Corporation	3,500
Puerto Rico sources	8,100
Lockheed	20,100
AECL powder	73,200
Radiation Resources	34,300
Minn. Mining & Mfg. Company	8,500
Gamma Industries	8,600
J. L. Shepherd	<u>14,100</u>
<u>Total Non-Inventory Material</u>	<u>174,900</u>
TOTAL INVENTORY AND NON-INVENTORY MATERIAL	211,760

Fabrication Summary

	<u>Sept. 1976</u>		<u>CY 1976</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	2	3,000	28	26,232
Shipped	0	0	2	3,000	18	24,032
Special Form Cans						
Fabricated	0	0	42	4,200	80	9,100
Shipped	0	0	11	1,720	44	8,842

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

Three ^{90}Sr heat sources containing 800 $\text{W}_t \pm 5\%$ each were fabricated for Teledyne-Isotopes. These units were loaded into thermoelectric generators and shipped to the customer during September. The 20,000 curie heat source will be fabricated in October for SNAM Progetti, Italy.

Product Inventory

(Decay calculated through August 31, 1976)

<u>Inventory Material</u>	<u>Amount (Ci)</u>
^{90}Sr titanate powder ($\pm 5\%$)	77,000
Sources in fabrication	20,000
RCA source	57,300
^{90}Sr silicate powder (est.)	28,000
Stock powder cans	<u>3,800</u>
<u>Total Inventory Material</u>	<u>186,100</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 ^a	<u>254,500</u>
<u>Total Non-Inventory Material</u>	<u>666,800</u>

TOTAL INVENTORY AND NON-INVENTORY MATERIAL 852,900

^aStrontium-90 purchased under DRRD program.

Fabrication Summary

	<u>Sept. 1976</u>		<u>CY 1976</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	3	343,800	3	343,800	3	343,800
Shipped	3	343,800	3	343,800	3	343,800
Special Form Cans						
Fabricated	0	0	0	0	0	0
Shipped	0	0	6	334	10	704

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

<u>Isotope</u>	<u>Number of Batches</u>	<u>Amount (Ci)</u>
Iodine-131	1	50
Xenon-133	4	2500

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>		
American Atomics	Tritium	4,000 Ci
New England Nuclear Corporation	Tritium	8,000 Ci
Self-Powered Lighting	Tritium	4,000 Ci
U. S. Radium Corporation	Tritium	10,000 Ci

Withdrawn Items

Westinghouse Electric Corporation	Iodine-131	1 mCi
University of California, LASL	Iodine-131	25 mCi

The radioisotope sales and shipments for the months of July through September 1975 and 1976 are given in Table 2.

Table 2. Radioisotope Sales and Shipments

Item	7-1-75 thru 9-30-75	7-1-76 thru 9-30-76
Inventory items	\$ 65,814	\$ 104,949
Major products	11,488	8,601
Radioisotope services	31,757	51,827
Cyclotron irradiations	24,880	54,312
Miscellaneous processed materials	13,984	5,149
Packing and Shipping	19,803	16,425
Total	\$ 167,726	\$ 241,263
Number of shipments	419	550

PUBLICATIONS

REPORTS

E. Lamb, *Radioisotope Distribution Program Progress Report for August 1976*, ORNL/TM-5659, Oak Ridge National Laboratory (September 1976).

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