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Radioisotope Distribution Program Progress Report for October 1976

E. Lamb



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OPERATIONS DIVISION

RADIOISOTOPE DISTRIBUTION PROGRAM
PROGRESS REPORT FOR OCTOBER 1976

E. Lamb

Work Sponsored by
ERDA Division of Biomedical and
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RADIOISOTOPE PRODUCTION AND MATERIALS DEVELOPMENT

REACTOR-PRODUCED RADIOISOTOPES

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

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

ACCELERATOR-PRODUCED ISOTOPES

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

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

Table 1. Cyclotron Irradiations and Runs for October 1976

<u>Date</u>	<u>Customer</u>	<u>Product</u>	<u>Target</u>	<u>Total Time</u> <u>(hr:min)</u>	<u>Total</u> <u>Charges</u>
<u>ORNL Programs</u>					
10- 6-76	ORAU	Carbon-11	Boron Oxide	6:00	\$ 716
10-21-76	ORAU	Carbon-11	Boron Oxide	4:50	582
10-28-76	ORAU	Carbon-11	Boron Oxide	5:30	659
10-29-76	ORAU	Carbon-11	Boron Oxide	<u>4:00</u>	<u>486</u>
				20:20	\$ 2,443
<u>Non-ORNL Programs</u>					
10- 5-76	New England Nuclear	Gallium-67	Zinc-68	34:15	\$ 5,330
10- 7-76	New England Nuclear	Germanium-68	Gallium	13:15	2,279
10-12-76	New England Nuclear	Gallium-67	Zinc-68	34:15	5,330
10-15-76	New England Nuclear	Cobalt-57	Nickel-58	51:15	9,122
10-19-76	New England Nuclear	Gallium-67	Zinc-68	35:15	5,480
10-26-76	New England Nuclear	Rubidium-84	Krypton-84	5:15	1,305
10-26-76	New England Nuclear	Gallium-67	Zinc-68	<u>37:15</u>	<u>5,780</u>
				210:45	\$34,626
<u>Isotopes Sales Inventory</u>					
10- 1-76	Isotopes Sales Dept.	Cobalt-57	Nickel	42:25	\$ 7,064

Cyclotron Operations

During the month of October the cyclotron operated a total of 273 hours. Five runs were interrupted due to equipment failure. Four of the runs were completed on schedule, with only one run having to be rescheduled. On October 6, 1976, the electrical breaker on the compressor which supplies cooling air for the oscillator failed and the run was completed by switching to plant air. High tank pressure occurred on October 7, 1976 as a result of a crack in the oscillator plate line bushing. A failure occurred October 11, 1976 due to the rupture of a line supplying cooling air to the grid on the oscillator. One of the five power supplies for the oscillator had to be taken off the line to replace the rectifiers which had failed October 14, 1976. The production of ^{84}Rb had to be rescheduled October 21, 1976 due to the malfunction of the vertical magnet supply.

Some of the larger routine maintenance jobs were: replacing target cam in flat plate target dolly; replacing solenoid and Ajax coupling on Nash compressor; repairing one of the gate valves; and switching generator 1C from old switch gear room to new switch gear and installing new brushes in generator.

FISSION PRODUCTS

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

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

Cesium-137 Pilot Production (*R. W. Schaiich*) (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>36,570</u>
<u>Total Inventory Material</u>	<u>36,570</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	3,500
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	211,470

Fabrication Summary

	<u>Oct. 1976</u>		<u>CY 1976</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	15	290	17	3,290	15	290
Shipped	15	290	17	3,290	15	290
Special Form Cans						
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. Schleich*) (Production and Inventory Accounts)

1. Process Status

A 20,000 curie ^{90}Sr heat source will be fabricated in November for SNAM Progetti, Italy. Vacuum hot press equipment problems have delayed fabrication of ^{90}Sr pellet.

Product Inventory

(Decay calculated through August 31, 1976)

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

^aStrontium-90 purchased under DRRD program.Fabrication Summary

	<u>Oct. 1976</u>		<u>CY 1976</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	3	343,800	0	0
Shipped	0	0	3	343,800	0	0
Special Form Cans						
Fabricated	0	0	0	0	0	0
Shipped	1	10	7	344	1	10

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

<u>Isotope</u>	<u>Number of Batches</u>	<u>Amount (Ci)</u>
Barium/Lanthanum-140	1	~300 mCi
Ruthenium-103	1	~11
Zirconium/Niobium-95	1	~8
Xenon-133	2	1350
Cerium-144	1	2.5
Strontium-89	1	11.2

RADIOISOTOPE SALES

J. E. Ratledge

Orders were received from Self-Powered Lighting for 25,000 Ci of tritium to be shipped over a 12-month period, from Airco, Inc. for 3,000 Ci of ^{85}Kr , and from General Electric for two ^{137}Cs sources.

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	6,000 Ci
Self-Powered Lighting	Tritium	1,000 Ci
Saunders-Roe	Tritium	5,000 Ci
Schwarz/Mann	Tritium	1,000 Ci
ICN Pharmaceuticals	Tritium	1,000 Ci
Radiochemical Centre, England*	Cesium-137	68,000 Ci
<u>Withdrawn Items</u>		
ORNL	Iodine-131	190.5 mCi

*Shipped from Richland, Washington

The radioisotope sales and shipments for the month of October 1976 and the first month of fiscal year 1977 are given in Table 2.

Table 2. Radioisotope Sales and Shipments

Item	10-1-75 thru 10-31-75	10-1-76 thru 10-31-76
Inventory items	\$ 31,901	\$ 26,165
Major products	3,895	7,378
Radioisotope services	3,800	7,504
Cyclotron irradiations	15,303	44,573
Miscellaneous processed materials	2,802	9,571
Packing and Shipping	<u>7,795</u>	<u>13,990</u>
Total	\$ 65,496	\$ 109,181
Number of shipments	161	178

PUBLICATIONS

REPORTS

E. Lamb, *Radioisotope Distribution Program Progress Report for September 1976*, ORNL/TM-5701, Oak Ridge National Laboratory (October 1976).

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