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OPERATIONS DIVISION

RADIOISOTOPE DISTRIBUTION PROGRAM
PROGRESS REPORT FOR SEPTEMBER 1977

Date Published - November 1977

E. Lamb

Work Sponsored by
DOE Division of Biomedical and
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RADIOISOTOPE DISTRIBUTION PROGRAM
PROGRESS REPORT FOR SEPTEMBER 1977

E. Lamb

SUMMARY

Information is reported on new production,
inventory status, operational problems, and
radioisotope sales.

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	35

ACCELERATOR-PRODUCED ISOTOPES

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

September 1977 ORNL 86-Inch Cyclotron runs for ORNL and non-ORNL programs are given in Table 1.

Table 1. Cyclotron Irradiations and Runs for September 1977

<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- 6-77	ORAU	Carbon-11	Boron Oxide	5:45	\$ 688
9-21-77	ORAU	Carbon-11	Boron Oxide	4:30	543
9-23-77	ORAU	Carbon-11	Boron Oxide	<u>5:30</u>	<u>659</u>
				15:45	\$ 1,890
<u>Non-ORNL Programs</u>					
9- 1-77	New England Nuclear	Cobalt-57	Nickel-58	51:15	\$ 8,784
9- 9-77	New England Nuclear	Cobalt-57	Nickel-58	51:15	8,892
9-14-77	New England Nuclear	Cobalt-57	Nickel-58	51:15	9,021
9-20-77	New England Nuclear	Gallium-67	Zinc-68	57:15	8,780
9-26-77	New England Nuclear	Gallium-67	Zinc-68	<u>47:15</u>	<u>7,280</u>
				258:15	\$42,757

Cyclotron Operations

In addition to the routine maintenance of the cyclotron, the 600 ampere rectifier supplying d.c. for the ion source was replaced due to water damage. The water damage resulted from the rupture of a cooling water hose due to the malfunctioning of a backup demineralized water pump supplying the building. Replacement and testing of the rectifier required three days. Another short delay to the startup of a run was caused by the malfunctioning of the current limiter ampere meter in the bias circuit which appeared as sparking in the cyclotron tank until it was noted that the problem was due to the malfunctioning meter.

FISSION PRODUCTS

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

Five of the ^{85}Kr enrichment columns were operative during the month of September and all the units were functioning according to design. Two columns in the south bank were unloaded during September, 1977. Expected yield on one of these columns should be >20% enrichment in ^{85}Kr . Analysis of products will be reported next month. One column in the north bank that was shut down due to an electrical overload in the chilled water compressor system was restarted. The last column in the south bank and two columns in the north bank are scheduled for unloading in October, 1977.

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

1. Process Status

The ^{137}Cs processing equipment has been placed in standby status.

2. Operational Summary

Product Inventory

(Decay calculated through August 31, 1977)

<u>Inventory Material</u>	<u>Amount (Ci)</u>
Cesium-137 chloride powder	<u>30,200</u>
<u>Total Inventory Material</u>	<u>30,200</u>

<u>Non-Inventory Material</u>	<u>Amount (Ci)</u>
Special Form Cans	4,300
Material returned or stored for customer	
Nuclear Research Corporation	0
J. L. Shepherd	50,600
New England Nuclear Corporation	2,700
Puerto Rico Sources	7,900
Lockheed	19,600
AECL powder	71,500
Radiation Resources	19,800
Minn. Mining & Mfg. Company	2,800
Gamma Industries	8,400
<u>Total Non-Inventory Material</u>	<u>187,600</u>
TOTAL INVENTORY AND NON-INVENTORY MATERIAL	217,800

Fabrication Summary

	<u>Sept. 1977</u>		<u>CY 1977</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	9	1,080	14	16,926	31	17,226
Shipped	9	1,080	17	35,555	76	50,493
Special Form Cans						
Fabricated	1	2,050	1	2,050	1	2,050
Shipped	1	2,050	13	7,500	13	7,500

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 generator loading of three ⁹⁰Sr heat sources for Sentinel-8 generators (Teledyne Energy Systems) was completed on September 2, 1977 and the units were shipped to the customer.

Product Inventory

(Decay calculated through August 31, 1977)

<u>Inventory Material</u>	<u>Amount (Ci)</u>
⁹⁰ Sr titanate powder (±5%)	0
Sources in fabrication	0
Stock powder cans	3,325
Stock solution	200
<u>Total Inventory Material</u>	<u>3,525</u>

<u>Non-Inventory Material</u>	<u>Amount (Ci)</u>
Batch 268r-74RE	7,900
Calorimeter Standards	4,800
Weather Bureau source	11,400
SNAP-7B	156,300
SNAP-7C	24,600
SNAP-7D	143,000
SNAP material purchase ^a	248,300
AGN-4	38,400
<u>Total Non-Inventory Material</u>	<u>634,700</u>

TOTAL INVENTORY AND NON-INVENTORY MATERIAL	638,225
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^aStrontium-90 purchased under DRRD program.Fabrication Summary

	<u>Sept. 1977</u>		<u>CY 1977</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	3	157,000	3	157,000	3	157,000
Shipped	3	157,000	4	177,000	4	177,000
Special Form Cans						
Fabricated	0	0	0	0	0	0
Shipped	0	0	2	20	2	20

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	3	2600
Zirconium/Niobium-95	1	50

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>		
New England Nuclear Corporation	Tritium	8,000 Ci
Self-Powered Lighting, Ltd.	Tritium	4,000 Ci
American Atomics Corporation	Tritium	15,000 Ci
Texas Instrument, Inc.	Tritium	1,500 Ci
Schwarz/Mann	Tritium	1,500 Ci

Items Used in Cooperative Programs

University of Kentucky	Platinum-195m	~40 mCi
University of Southern California	Platinum-195m	10 mCi

The radioisotope sales and shipments for October 1975 through September 1976 and the 12 months of fiscal year 1977 are given in Table 2.

Table 2. Radioisotope Sales and Shipments

Item	10-1-75 thru 9-30-76	10-1-76 thru 9-30-77
Inventory items	\$ 351,386	\$ 479,800
Major products	54,386	109,847
Radioisotope services	163,469	250,386
Cyclotron irradiations	207,289	314,222
Miscellaneous processed materials	48,590	102,485
Packing and Shipping	<u>111,817</u>	<u>194,584</u>
Total	\$ 936,937	\$ 1,451,324
Number of shipments	2,133	2,438

PUBLICATIONS

REPORTS

E. Lamb, *Radioisotope Distribution Program Progress Report for August 1977*, ORNL/TM-6080, Oak Ridge National Laboratory (September 1977).

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