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Radioisotope Distribution Program Progress Report for January 1978

E. Lamb

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OPERATIONS DIVISION

RADIOISOTOPE DISTRIBUTION PROGRAM
PROGRESS REPORT FOR JANUARY 1978

Date Published - April, 1978

E. Lamb

Work Sponsored by
DOE Division of Biomedical and
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RADIOISOTOPE DISTRIBUTION PROGRAM
PROGRESS REPORT FOR JANUARY 1978

E. Lamb

SUMMARY

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

RADIOISOTOPE PRODUCTION AND MATERIALS

REACTOR-PRODUCED RADIOISOTOPES

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

<u>Processed Units</u>	
<u>Radioisotope</u>	<u>Amount (mCi)</u>
Calcium-47	26

Iridium-192 Production (*R. W. Schaiach*)

A total of six customer irradiation units and five ORNL HFIR units (RF) were processed during the month of January 1978. Seven shipments containing 40,300 Ci of ^{192}Ir were made during this period. The average ^{192}Ir yield for the various type irradiation units, pellet sizes, and HFIR cycles are as follows.

<u>Type Capsule</u>	<u>Pellet Size</u>	<u>HFIR Cycles</u>	<u>Curies ^{192}Ir/gram at HFIR Shutdown</u>
RG	1/16" diam x 1/32"	2	390
RG	0.107" diam x 0.011"	2	580
TO	0.107" diam x 0.006"	2	635
OT	0.141" diam x 0.006"	2	580
GB	0.107" diam x 0.011"	2	590
GB	0.141" diam x 0.011"	2	590
RB	0.107" diam x 0.011"	1	650
RB	1/8" diam x 1/32"	1	420
RB	1/16" diam x 1/32"	1	400

These numbers will be refined as more units are processed.

Other GETR Products and Services (*E. Lamb*)

The General Electric Vallecitos Nuclear Center requested quotations on the irradiation of partially irradiated ^{60}Co capsules, the irradiation of two ^{235}U targets per week, and the irradiation of two GE-type iridium targets for one HFIR cycle for shipment as unprocessed units to GE. Estimates are being prepared for the requested quotations.

ACCELERATOR-PRODUCED ISOTOPES

Cyclotron Service Irradiations (*M. R. Skidmore*)
(Production and Inventory Accounts)

January 1978 ORNL 86-Inch Cyclotron runs for ORNL and non-ORNL programs are given in Table 1.

Table 1. Cyclotron Irradiations and Runs for January 1978

Date	Customer	Product	Target	Total Time (hr:min)	Total Charges
<u>ORNL Programs</u>					
None					
<u>Non-ORNL Programs</u>					
1- 2-78	New England Nuclear	Gallium-67	Zinc-68	29:15	\$ 4,580
1-13-78	New England Nuclear	Gold-195	Platinum	25:15	4,018
1-16-78	New England Nuclear	Gallium-67	Zinc-68	35:15	5,480
1-19-78	New England Nuclear	Cobalt-57	Nickel-58	51:15	8,916
1-23-78	New England Nuclear	Gallium-67	Zinc-68	25:15	3,980
1-26-78	Westinghouse Hanford	Beryllium-7	Lithium	2:15	670
1-31-78	New England Nuclear	Gallium-67	Zinc-68	37:45	5,855
				206:15	\$33,499

During the month of January, operations were interrupted three times. From January 5th to 12th carbon shields on the inner wall and the ion accelerating electrode were replaced. On January 17th a cobalt-57 run was interrupted due to a malfunctioning plate current meter on the control console. On January 24th and 25th, half of the rectifiers and one transformer in the ion filament power supply had to be replaced.

FISSION PRODUCTS

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

One ^{85}Kr enrichment column was operative during the month of January and the unit functioned according to design. The three columns in the south bank are shut down due to a shortage of manpower to check out the system. A tentative schedule calls for checking and loading the south bank in March 1978.

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

1. Process Status

The ¹³⁷Cs 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>29,860</u>
<u>Total Inventory Material</u>	<u>29,860</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	2,500
Puerto Rico Sources	7,900
Lockheed	19,600
AECL powder	71,500
Radiation Resources	19,800
Minn. Mining & Mfg. Company	2,800
Gamma Industries	<u>8,400</u>
<u>Total Non-Inventory Material</u>	<u>187,400</u>
TOTAL INVENTORY AND NON-INVENTORY MATERIAL	217,260

Fabrication Summary

	<u>Jan. 1978</u>		<u>CY 1978</u>		<u>FY 1978</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	1	5
Shipped	1	100	1	0	5	300

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 source fabrication equipment has been placed in standby status.

Product Inventory

(Decay calculated through August 31, 1977)

<u>Inventory Material</u>	<u>Amount (Ci)</u>
^{90}Sr titanate powder ($\pm 5\%$)	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 26Sr-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 Powder	38,400
<u>Total Non-Inventory Material</u>	<u>634,700</u>
TOTAL INVENTORY AND NON-INVENTORY MATERIAL	638,225

^aStrontium-90 purchased under DRRD program.

An inquiry has been received from Teledyne Energy Systems to fabricate three ^{90}Sr titanate units using the SNAP-7D material. This project can be accomplished by the end of 1978.

Fabrication Summary

	<u>Jan. 1978</u>		<u>CY 1978</u>		<u>FY 1978</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	0	0	0	0

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

The production of short-lived fission products is listed in the table below.

<u>Isotope</u>	<u>Number of Batches</u>	<u>Amount (Ci)</u>
Xenon-133	4	2400

RADIOISOTOPE SALES

J. E. Ratledge

Mr. Robert Taylor of Monsanto Research Corporation visited Isotope Sales in January for discussion on americium-241.

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	10,000 Ci
Self-Powered Lighting, Ltd.	Tritium	3,000 Ci
Saunders-Roe Developments, England	Tritium	30,000 Ci
<u>Withdrawn Items</u>		
Mine Safety Appliances Company	Iodine-131	150 mCi
Technical Operations	Iridium-192	21,037 Ci
Source Production and Equipment Company	Iridium-192	9,334 Ci
Gamma Industries	Iridium-192	7,530 Ci
Automation Industries	Iridium-192	11,314 Ci
Gulf Nuclear Inc.	Iridium-192	9,440 Ci
<u>Items Used in Cooperative Programs</u>		
University of Southern California	Platinum-195m	10 mCi
Veterans Administration Hospital	Platinum-195m	15 mCi
University of Arizona	Platinum-195m	5 mCi

The radioisotope sales and shipments for the first four months of fiscal year 1977 and fiscal year 1978 are given in Table 2.

Table 2. Radioisotope Sales and Shipments

Item	10-1-76 thru 1-31-77	10-1-77 thru 1-31-78
Inventory items	\$ 102,985	\$ 336,340
Major products	36,399	150,695
Radioisotope services	61,507	55,558
Cyclotron irradiations	165,934	116,143
Miscellaneous processed materials	18,502	63,390
Packing and shipping	63,189	65,335
Total	\$ 448,516	\$ 787,461
Number of shipments	792	788

PUBLICATIONS

REPORTS

E. Lamb, *Radioisotope Distribution Program Progress Report for December 1977*, ORNL/TM-6244, Oak Ridge National Laboratory (February 1978).

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EXTERNAL DISTRIBUTION

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