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Radioisotope Distribution Program Progress Report for May 1978

E. Lamb

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OPERATIONS DIVISION

RADIOISOTOPE DISTRIBUTION PROGRAM

PROGRESS REPORT FOR MAY 1978

Date Published - July 1978

E. Lamb

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RADIOISOTOPE DISTRIBUTION PROGRAM
PROGRESS REPORT FOR MAY 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. Schaiich*)
(Production and Inventory Accounts)

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

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

Eight customer irradiation units and twelve ORNL HFIR units (RB) containing 120,000 curies of iridium-192 at HFIR discharge date were processed during the month of May 1978. Fourteen shipments containing 92,900 curies of iridium-192 were made during this period.

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

We transmitted to ORO a recommended pricing formula for carbon-14 being held at ORNL following withdrawal from its supply. The pricing formula is based on costs in inventory at the time of write-off. Recommended prices range from \$4.00/mCi for quantities up to 1,000 mCi to \$2.50/mCi for quantities over 111,000 mCi for carbon-14 assaying 85% or higher. The price of lower assay carbon-14 would be proportionally reduced.

Calculations of the maximum quantity of molybdenum capable of being irradiated in the ORR hydraulic tubes as determined by permissible heat flux are being made. An estimate of cost for the irradiation of MoO₃ targets was transmitted to General Electric personnel who indicated the cost would be too high for molybdenum-99 production in the oxide target. We offered to investigate the possibility of metal molybdenum irradiation and the irradiation of MoO₃ targets in the ORR lattice with General Electric.

ACCELERATOR-PRODUCED ISOTOPES

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

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

Table 1. Cyclotron Irradiations and Runs for May 1978

Date	Customer	Product	Target	Total Time (hr:min)	Total Charges
<u>ORNL Programs</u>					
5-1-78	ORAU	Carbon-11	Boron Oxide	5:20	\$ 640

Most of the month was spent in maintenance of the cyclotron. The work was concentrated on the RF system. The clamps around the dee step to spider were cleaned; every RF contact in the oscillator cabinet was cleaned; and the contacts in the filament loop section were cleaned.

FISSION PRODUCTS

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

The south bank of the ^{85}Kr thermal diffusion columns was loaded with enriched material (~9%) in April. Tentative schedule calls for unloading the south bank in July. The north bank was emptied and leak tested during May 1978. Major repairs are required for the north bank due to leakage on the end welds of approximately 25% of the calrods. This work should be completed in June and startup of the north bank is scheduled for June 30, 1978.

Cesium-137 Pilot Production (*R. W. Schaich*)
(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>29,680</u>
<u>Total Inventory Material</u>	<u>29,680</u>

<u>Non-Inventory Material</u>	<u>Amount (Ci)</u>
Special Form Cans	4,200
Material returned or stored for customer	
Nuclear Research Corporation	0
J. L. Shepherd	26,500
New England Nuclear Corporation	2,100
Puerto Rico Sources	7,900
Lockheed	19,600
AECL powder	38,100
Radiation Resources	19,800
Minn. Mining & Mfg. Company	0
Gamma Industries	<u>8,400</u>
<u>Total Non-Inventory Material</u>	<u>126,600</u>
 TOTAL INVENTORY AND NON-INVENTORY MATERIAL	 156,280

Fabrication Summary

	<u>May 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	1	5	40	76,105	40	76,105
Shipped	7	14,125	32	57,625	32	57,625
Special Form Cans						
Fabricated	0	0	0	0	1	5
Shipped	2	200	7	2,400	11	2,600

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 ⁹⁰Sr 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 (±5%)	0
Sources in fabrication	0
Stock powder cans	3,095
Stock solution	<u>200</u>
<u>Total Inventory Material</u>	<u>3,295</u>

<u>Non-Inventory Material</u>	<u>Amount (Ci)</u>
New England Nuclear Corporation	225
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>634,925</u>
<u>TOTAL INVENTORY AND NON-INVENTORY MATERIAL</u>	<u>638,220</u>

^aStrontium-90 purchased under DRRD program.

Fabrication Summary

	<u>May 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	6	40	6	40
Shipped	0	0	1	5	1	5

Short-Lived Fission Product Production (*R. W. Schaich*)
(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>
Iodine-131	1	50
Xenon-133	5	3200

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	12,000 Ci
Brandhurst Co., Ltd., England	Tritium	30,000 Ci
American Atomics Corporation	Tritium	150,000 Ci
ICN Pharmaceuticals	Tritium	1,000 Ci
Self-Powered Lighting, Ltd.	Tritium	7,000 Ci
Merz & Benteli Nuclear, Switzerland	Tritium	15,000 Ci
Saunders-Roe Developments, England	Tritium	30,000 Ci
Radiochemical Centre, Ltd., England	Tritium	60,000 Ci
<u>Withdrawn Items</u>		
Gulf Nuclear	Iridium-192	10,433 Ci
Gamma Industries	Iridium-192	5,600 Ci
Industrial Nuclear Co.	Iridium-192	5,400 Ci
Technical Operations	Iridium-192	37,693 Ci
Source Production and Equipment Co.	Iridium-192	18,962 Ci
Automation Industries	Iridium-192	14,811 Ci
<u>Items Used in Cooperative Programs</u>		
University of Arizona	Platinum-195m	~10 mCi
V.A. Center, Austin, Texas	Platinum-195m	15 mCi
University of Southern California	Platinum-195m	7 mCi
National Institutes of Health, N.C.	Potassium-43	6 mCi
National Institutes of Health, Md	Potassium-43	1 mCi

The radioisotope sales and shipments for the first seven 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 5-31-77	10-1-77 thru 5-31-78
Inventory Items	\$ 267,947	\$ 97,636
Tritium		989,780
Major Products	75,732	363,796
Iridium-192		555,099
Radioisotope Services	144,884	198,620
Cyclotron Irradiations	170,551	190,731
Miscellaneous Processed Materials	47,561	133,189
Packing and Shipping	129,699	143,795
Total	\$ 836,374	\$2,672,646
Number of Shipments	1,633	1,725

PUBLICATIONS

REPORTS

E. Lamb, *Radioisotope Distribution Program Progress Report for April 1978*, ORNL/TM-6417, Oak Ridge National Laboratory (June 1978).

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