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Radioisotope Distribution Program Progress Report for August 1978

E. Lamb

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OPERATIONS DIVISION

RADIOISOTOPE DISTRIBUTION PROGRAM

PROGRESS REPORT FOR AUGUST 1978

E. Lamb

Work Sponsored by
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RADIOISOTOPE DISTRIBUTION PROGRAM
PROGRESS REPORT FOR AUGUST 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. Schaich*)
(Production and Inventory Accounts)

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

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

Fifteen customer irradiation units and sixteen ORNL HFIR units (RB) containing 211,000 curies of ^{192}Ir at HFIR discharge date were processed during the month of August 1978. Fifteen shipments containing 85,600 curies of ^{192}Ir were made during this period.

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

Gaylord King, Medi-Physics, Inc., visited ORNL to discuss the provision of neutron-produced ^{99}Mo by ORNL in case of a scheduled or emergency shut-down of the University of Missouri reactor where all of their irradiations to produce ^{99}Mo are done. Evidently a scheduled shutdown of that reactor is predicted in CY 1979. Medi-Physics is also interested in obtaining weekly shipments of neutron-produced ^{99}Mo from ORNL to one of their five processing facilities. We furnished data about production rates, specific activities, and possible costs which Medi-Physics will study.

The General Electric Company submitted a proposal to ORO for the irradiation of partially irradiated ^{60}Co targets in HFIR in response to our quotation of several months ago. In return, we proposed to ORO that $>350 \text{ Ci/g } ^{60}\text{Co}$ be produced in HFIR by irradiating new target material in the RB or in the target positions. This irradiation would take about seven cycles (~ 23 days/cycle) and would be comparable to the time required to irradiate the GETR targets in a lower flux position to achieve the same specific activity. The cost would be less in the case of new targets.

A bid for most of the ^{14}C product remaining at ORNL was received from New England Nuclear Corporation. An analysis of the bid and our recommendation will be sent to ORO for their approval.

ACCELERATOR-PRODUCED ISOTOPES

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

During August 1978 the ORNL 86-Inch Cyclotron operated 20:25 hours on ORNL programs for total charges of \$2,448 and 331:30 hours on Non-ORNL programs for total charges of \$57,354.

Four runs were interrupted this month -- three due to failures in the high voltage power supplies, and one due to the failure of the magnet cooling oil pump. On August 2nd overloading of the main breaker supplying the high voltage power supplies resulted in a 3-hour outage. On August 3rd four of the five high voltage power supplies failed resulting in the termination of a run. The induction regulator on one power supply failed, two supplies had bad rectifiers, and another had bad rectifiers and the main power contacts were welded together. On August 23rd another induction regulator had to be replaced. On August 29th the F134 tube in the limiter high voltage power supply had to be replaced.

FISSION PRODUCTS

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

The north bank of the ^{85}Kr Thermal Diffusion Columns was operated approximately two weeks of the month before leaks were detected on AB column. The columns were shut down and unloaded. Maintenance personnel found several large leaks in both the AB and B columns and proceeded with repairs. Several other leaks have been detected and are in the process of being repaired. Installation of a new electrical header for the chilled water compressors to allow operation of all six columns simultaneously was started. This work is approximately 10% complete. An investigation is underway to determine a correlation between observed count rate and % krypton.

The south bank of columns continued to operate as designed. A shutdown of this system is planned for September 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>23,400</u>
<u>Total Inventory Material</u>	<u>23,400</u>
<u>Non-Inventory Material</u>	<u>Amount (Ci)</u>
Reject Pellets and Sources	4,300
Special Form Cans	4,000
Material returned or stored for customer	
J. L. Shepherd	22,535
New England Nuclear Corporation	1,975
Puerto Rico Sources	7,700
Lockheed	19,100
AECL powder	36,949
Radiation Resources	19,100
Gamma Industries	<u>8,200</u>
<u>Total Non-Inventory Material</u>	<u>123,859</u>
TOTAL INVENTORY AND NON-INVENTORY MATERIAL	147,259

Fabrication Summary

	<u>Aug. 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	40	76,105	40	76,105
Shipped	0	0	33	57,630	33	57,630
Special Form Cans						
Fabricated	0	0	6	600	7	605
Shipped	1	25	9	2,525	13	2,725

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	3,170
Stock solution	180
<u>Total Inventory Material</u>	<u>3,350</u>
<u>Non-Inventory Material</u>	<u>Amount (Ci)</u>
^{90}Sr Fluoride	60,000
New England Nuclear Corporation	195
Batch 26Sr-74RE	7,700
Calorimeter Standards	4,700
Weather Bureau Source	11,100
SNAP-7B	152,500
SNAP-7C	24,000
SNAP-7D	139,500
SNAP material purchase ^a	242,200
AGN-4 Powder	37,500
<u>Total Non-Inventory Material</u>	<u>679,395</u>
TOTAL INVENTORY AND NON-INVENTORY MATERIAL	682,745

^aStrontium-90 purchased under DRRD program.

Fabrication Summary

	<u>Aug. 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	3	35	3	35

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>
Xenon-133	5	2900

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	10,000 Ci
Brandhurst Company, Ltd., England	Tritium	15,000 Ci
American Atomics Corporation	Tritium	50,000 Ci
Self-Powered Lighting, Ltd.	Tritium	6,000 Ci
Saunders-Roe Developments, Ltd., England	Tritium	30,000 Ci
ICN Pharmaceuticals, Inc.	Tritium	1,000 Ci
<u>Withdrawn Items</u>		
Automation Industries, Inc.	Iridium-192	60,750 Ci
Gulf Nuclear	Iridium-192	9,430 Ci
Industrial Nuclear Company	Iridium-192	5,601 Ci
Gamma Industries	Iridium-192	10,878 Ci
<u>Items Used in Cooperative Programs</u>		
University of Mississippi Medical Center	Potassium-43	32.7 mCi
V.A. Hospital, Lexington, Kentucky	Platinum-195m	19 mCi

The radioisotope sales and shipments for the first eleven months of fiscal year 1977 and fiscal year 1978 are given in Table 1.

Table 1. Radioisotope Sales and Shipments

Item	10-1-76 thru 8-31-77	10-1-77 thru 8-31-78
Inventory Items	\$ 402,417	\$ 153,799
Tritium		1,551,816
Major Products	100,291	523,473
Iridium-192		845,511
Radioisotope Services	178,970	270,139
Cyclotron Irradiations	266,388	304,468
Miscellaneous Processed Materials	91,101	206,195
Packing and Shipping	<u>175,274</u>	<u>201,115</u>
Total	\$1,214,441	\$4,056,516
Number of Shipments	2,202	2,410

PUBLICATIONS

REPORTS

E. Lamb, *Radioisotope Distribution Program Progress Report for July 1978*, ORNL/TM-6536, Oak Ridge National Laboratory (August 1978).

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