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Radioisotope Distribution Program Progress Report for September 1978

E. Lamb

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OPERATIONS DIVISION

RADIOISOTOPE DISTRIBUTION PROGRAM
PROGRESS REPORT FOR SEPTEMBER 1978

E. Lamb

Work Sponsored by
DOE Division of Biomedical and
Environmental Research

November, 1978

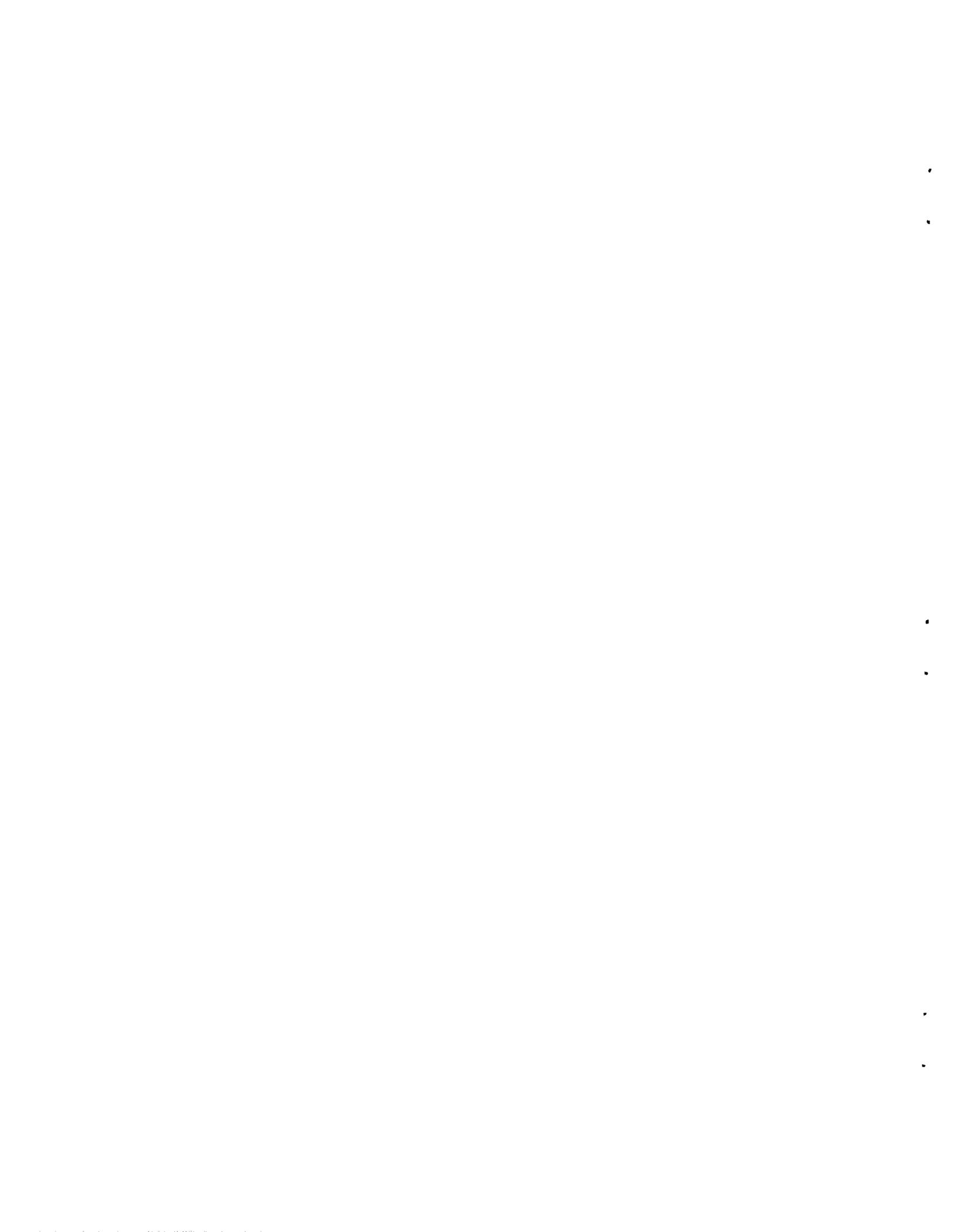
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RADIOISOTOPE DISTRIBUTION PROGRAM
PROGRESS REPORT FOR SEPTEMBER 1978

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*)

Seven customer irradiation units and seven ORNL HFIR units (RB) containing 98,000 curies of ^{192}Ir at HFIR discharge date were processed during the month of September 1978. Twenty-four shipments containing 112,000 curies of ^{192}Ir were made during this period.

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

An order was received from General Electric Company for the irradiation of 60 grams of cobalt pellets for six to eight months in the HFIR. Two irradiation capsules with a loading of one gram of cobalt per centimeter of length were prepared for insertion in RB positions in the HFIR on October 7, 1978.

ACCELERATOR-PRODUCED ISOTOPES

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

During September 1978, the ORNL 86-Inch Cyclotron operated 13:35 hours for ORNL and Oak Ridge DOE Programs for total charges of \$1,644. Non-ORNL and Isotopes Sales Inventory irradiations were 239:05 hours with total charges of \$38,485.

Several runs were interrupted this month due to failure of either our equipment or equipment of other groups in the building. A water line supplying cooling water to the Fusion Energy Division ruptured resulting in loss of cooling water to the Cyclotron. Three days were lost beginning September 9th due to an electrical failure on the target dolly. On September 21st the Cyclotron vacuum tank suffered inleakage of air due to the failure of a seal on the vacuum lock during a target change. A carbon-11 run on September 22nd was delayed due to a water leak on the target capsule. On September 24th a run was delayed by failure of two 1,000 mmf capacitors in the grid circuit of the oscillator system.

FISSION PRODUCTS

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

All thermal diffusion columns were shut down for maintenance and inventory by September 12, 1978. The south bank was unloaded, purged, and transferred to maintenance by the end of the month. The columns will be leak checked and a new radiation detector installed on "D" column. Two weeks were required for unloading because of an insufficient number of gas cylinders to contain the volume of three columns. "A" column was loaded with 622 curies of 5-6% enriched krypton for storage purposes. A total of 476 curies of 19.9% enriched krypton was obtained from the south bank, plus 118 curies of 12.3% and 205 curies of 10.5%.

A new count rate meter was fabricated and installed on the monitoring system to properly monitor the activity levels on enrichments of greater than 20% krypton-85.

Installation of a new electrical header for the chilled water compressor was completed and all six columns will be operable in October 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>8,300</u>
<u>Total Inventory Material</u>	<u>8,300</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	8,200
<u> Total Non-Inventory Material</u>	<u>123,859</u>
 TOTAL INVENTORY AND NON-INVENTORY MATERIAL	 132,159

Fabrication Summary

	<u>Sept. 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	41	76,110	41	76,110
Shipped	1	5	34	57,635	34	57,635
Special Form Cans						
Fabricated	15	15,000	21	15,600	22	15,600
Shipped	2	1,100	11	3,625	15	3,825

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. Schriber*)
(Production and Inventory Accounts)

1. Process 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	175
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	242,200
AGN-4 Powder	<u>37,500</u>
<u>Total Non-Inventory Material</u>	<u>679,375</u>
TOTAL INVENTORY AND NON-INVENTORY MATERIAL	682,725

Fabrication Summary

	<u>Sept. 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	1	20	4	55	4	55

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	4	1700
Zirconium-95/Niobium-95	1	7
Ruthenium-103	2	27

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	9,000 Ci
Brandhurst Company, Ltd., England	Tritium	15,000 Ci
American Atomics Corporation	Tritium	100,000 Ci
Self-Powered Lighting, Ltd.	Tritium	17,000 Ci
Saunders-Roe Developments, Ltd., England	Tritium	30,000 Ci
ICN Pharmaceuticals, Inc.	Tritium	1,000 Ci
U.S. Radium Corporation	Tritium	13,000 Ci
Merz & Benteli Nuclear, Switzerland	Tritium	15,000 Ci
The Cyclotron Corporation	Tritium	10,001 Ci
Lawrence Livermore Laboratory	Tritium	3,419 Ci
E.I. duPont de Nemours & Co., Inc.	Tritium	5,703 Ci

<u>Withdrawn Items</u>		
Automation Industries, Inc.	Iridium-192	60,750 Ci
Gulf Nuclear	Iridium-192	3,777 Ci
Industrial Nuclear Company	Iridium-192	6,573 Ci
Gamma Industries	Iridium-192	30,869 Ci
Source Production & Equipment Company	Iridium-192	16,242 Ci
Technical Operations, Inc.	Iridium-192	38,073 Ci

<u>Items Used in Cooperative Programs</u>		
University of Mississippi Medical Center	Potassium-43	32.7 mCi
University of Southern California School of Medicine	Platinum-195m	2 mCi

The radioisotope sales and shipments for the twelve 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 9-30-77	10-1-77 thru 9-30-78
Inventory Items	\$ 479,800	\$ 128,592
Tritium		1,732,537
Major Products	109,847	574,351
Iridium-192		1,120,639
Radioisotope Services	250,386	295,007
Cyclotron Irradiations	314,222	369,847
Miscellaneous Processed Materials	102,485	237,417
Packing and Shipping	<u>194,584</u>	<u>222,730</u>
Total	\$1,451,324	\$4,681,120
Number of Shipments	2,438	2,647

PUBLICATIONS

Reports

E. Lamb, *Radioisotope Distribution Program Progress Report for August 1978*, ORNL/TM-6603, Oak Ridge National Laboratory (September 1978).

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