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# RADIOISOTOPE DISTRIBUTION PROGRAM PROGRESS REPORT FOR DECEMBER 1973

J. H. Gillette

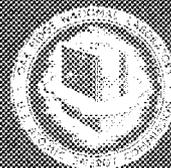


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ORNL-TM-4457

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ISOTOPES DEVELOPMENT CENTER

RADIOISOTOPE DISTRIBUTION PROGRAM  
PROGRESS REPORT FOR DECEMBER 1973

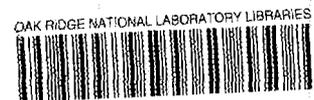
J. H. Gillette

Work Sponsored by  
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JANUARY 1974

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Oak Ridge, Tennessee 37830  
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RADIOISOTOPE DISTRIBUTION PROGRAM  
PROGRESS REPORT FOR DECEMBER 1973

*J. H. Gillette*

RADIOISOTOPE PRODUCTION AND MATERIALS DEVELOPMENT

REACTOR-PRODUCED RADIOISOTOPES

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

Processed Units	
Radioisotope	Amount (mCi)
Calcium-47	24
Copper-67	24

ACCELERATOR-PRODUCED ISOTOPES

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

December 1973 ORNL 86-Inch Cyclotron runs for ORNL and non-ORNL programs are given in Table 1.

Table 1. Cyclotron Irradiations and Runs for December 1973

Date	Customer	Product	Target	Total Time (hr:min)	Total Charges
<u>ORNL Programs</u>					
11-26-73	Isotopes	Bismuth-206	Lead-207	2:00	\$ 197
12-6-73	ORAU	Gallium-67	Zinc-68	9:15	886
12-13-73	Physics Division	Cobalt-61	Nickel-64	8:55	868
12-14-73	Physics Division	Cobalt-61	Nickel-64	2:45	268
12-18-73	Physics Division	Cobalt-61	Nickel-64	5:40	553
				28:35	\$2772

FISSION PRODUCTS

Krypton-85 Enrichment (*R. J. Lauer*)

Calrod heater assemblies have been fabricated and leak tested successfully. The water baffle plates have been modified and are ready for assembly. Inspection Engineering sent a representative to the vendor's

plant to inspect the Inconel tubing. The tubing has been approved for shipment to ORNL.

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

1. Process Status

The  $^{137}\text{Cs}$  process equipment is in standby condition.

2. Operational Summary

<u>Product Inventory</u>		<u>Amount (Ci)</u>
<u>Inventory Material</u>		
Cesium-137 chloride products		550,544
Sources in fabrication		0
Completed sources		<u>14,015<sup>a</sup></u>
<u>Total Inventory Material</u>		<u>564,559</u>
<u>Non-Inventory Material</u>		
Material returned or stored for customer		
Puerto Rico sources		8,760
Lockheed		29,050
AECL powder		86,360
Radiation Resources		<u>37,450</u>
<u>Total Non-Inventory Material</u>		<u>161,620</u>
TOTAL INVENTORY AND NON-INVENTORY MATERIAL		726,179

<sup>a</sup>Includes 6400 Ci unclaimed sources.

	<u>December 1973</u>		<u>CY 1973</u>		<u>FY 1974</u>	
	<u>No.</u>	<u>Ci</u>	<u>No.</u>	<u>Ci</u>	<u>No.</u>	<u>Ci</u>
Sources						
Fabricated	0	0	35	44,955	25	22,155
Shipped	0	0	28	37,341	18	14,541
Special Form Cans						
Fabricated	0	0	45	26,000	2	800
Shipped	0	0	42	23,900	2	800

## 3. Current Orders

Current orders for  $^{137}\text{Cs}$  as sources or bulk powder are as follows:

<u>Customer</u>	<u>Amount (Ci)</u>	<u>Estimated Shipping Date</u>
J. L. Shepherd	7,614	a
3M Company	300	b
Isomedix Corporation	96,000	March 1974

<sup>a</sup>Holding for receipt of customer's container.

<sup>b</sup>Holding for request for shipment.

Strontium-90 Pilot Production (*R. W. Schleich*)  
(Production and Inventory Accounts)

## 1. Process Status

The maintenance work in the  $^{90}\text{Sr}$  powder handling cell proceeded on schedule. The processing of fresh feed should be in progress by the end of January 1974. The decontamination of the hot-press cell was completed but the vacuum hot press will require further decontamination to allow direct maintenance on the unit. A spare vacuum hot press has been set up for calibration and cold testing and is scheduled for installation in the  $^{90}\text{Sr}$  powder handling cell by January 31, 1974. This unit will be used initially to fabricate six hot-pressed pellets for Teledyne Isotopes. After the source fabrication is completed, the hot press will be used for the calcination and sintering of all the  $^{90}\text{Sr}$  feed at the FPD. The  $^{90}\text{Sr}$  solution will be converted to distronium titanate, sintered, doubly encapsulated in stainless steel, and stored in the Graphite Reactor Canal.

<u>Inventory Material</u>	<u>Amount (Ci)</u>
Feed solution ( $\pm 25\%$ ) <sup>a</sup>	690,800
$^{90}\text{Sr}$ titanate products ( $\pm 10\%$ )	87,200
"AGN" liners	145,500
SNAP-7F sources	115,200
RCA source	62,400
$^{90}\text{Sr}$ silicate powder	30,500
Recovery material	25,400
Stock powder cans	<u>6,200</u>
Total	1,163,200
Less SNAP material purchase <sup>b</sup>	<u>277,400</u>
<u>Total Inventory Material</u>	<u>885,800</u>

	<u>Amount (Ci)</u>
<u>Non-Inventory Material</u>	
Quehanna recovery material	47,800
Weather Bureau source	12,700
SNAP-7B	173,800
SNAP-7C	27,300
SNAP-7D	159,000
URIPS (billed at 221,000 Ci)	216,000
SNAP material purchase	<u>277,400</u>
<u>Total Non-Inventory Material</u>	<u>914,000</u>

TOTAL INVENTORY AND NON-INVENTORY MATERIAL 1,799,800

<sup>a</sup>Includes 200,000 Ci having power density sufficiently high for heat sources.

<sup>b</sup>Strontium-90 purchased under DRRD program and retained in solution form.

Fabrication Summary

	<u>December 1973</u>		<u>CY 1973</u>		<u>FY 1974</u>	
	<u>No.</u>	<u>Ci</u>	<u>No.</u>	<u>Ci</u>	<u>No.</u>	<u>Ci</u>
Sources						
Fabricated	0	0	1	45,700	1	45,700
Shipped	0	0	1	45,700	1	45,700
Special Form Cans						
Fabricated	0	0	71	1,700	0	0
Shipped	0	0	73	2,200	1	500

3. Current Orders

<u>Customer</u>	<u>Amount (Ci)</u>	<u>Estimated Shipping Date</u>
U. S. Navy	221,000	a
New England Nuclear Corporation	9	a
Teledyne Isotopes	155,000	March 1974

<sup>a</sup>All items are complete and awaiting receipt of further shipping instructions.

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	2	700
Iodine-131	1	3
Ruthenium-105	1	19
Niobium-95	1	2.8

Six batches of  $^{129}\text{I}$  were processed for a total of 32,985 mg.

Promethium-147 Shipments and Current Orders

The 3M Company has ordered 5900 Ci of  $^{147}\text{Pm}$  to be shipped from Richland, Washington, during January 1974.

RADIOISOTOPE SALES

*J. E. Ratledge*

A request for quotation was received from Radiochemical Centre England, for 20 kCi of  $^{137}\text{Cs}$  as bulk CsCl powder.

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
Saunders-Roe Developments, Ltd.	Tritium	5,000 Ci
Self-Powered Lighting, Ltd.	Tritium	2,000 Ci
Donald W. Douglas Laboratory	Promethium-147	50,000 Ci <sup>a</sup>
<u>Withdrawn Items</u>		
National Institute	Copper-67	~6.5 mCi
Mayo Clinic	Copper-67	~13.0 mCi
Yale University	Carbon-14 target	~1.0 mCi
University of Pittsburgh	Iodine-131	50.0 mCi
University of Rochester	Iodine-131	50.0 mCi
Cleveland Metropolitan General Hospital	Iodine-131	50.0 mCi
<u>Items Used in Cooperative Programs</u>		
Oak Ridge Associated Universities	Gallium-67	390.0 mCi
University of California, San Francisco	Bismuth-201	2.0 mCi
University of Southern California	Platinum-195m	6.5 mCi
National Institutes of Health	Potassium-43	15.0 mCi
Georgetown University Medical Center	Gadolinium-153 <sup>b</sup>	~20.0 Ci

<sup>a</sup>To be shipped from Richland, Washington.

<sup>b</sup>On loan.

The radioisotope sales proceeds and shipments for the first five months of FY 1973 and FY 1974 are given in Table 2.

Table 2. Radioisotope Sales and Shipments

Item	7-1-72 thru 11-30-72	7-1-73 thru 11-30-73
Inventory items	\$146,057	\$175,390
Major products	23,633	40,085
Radioisotope services	60,452	89,608
Cyclotron irradiations	37,799	37,950
Miscellaneous processed material	23,198	23,283
Packing and shipping	27,955	28,427
Total	\$319,094	\$394,743
Number of Shipments	871	805

## ADMINISTRATIVE

### VISITORS

Mr. George Dietz of Isomedix, Inc., visited on December 4, 1973, to discuss details of their order for  $^{137}\text{Cs}$  sources. It was concluded that ORNL would supply 18 cylindrical sources each containing 7 kCi rather than 36 BNL-type sources, resulting in a saving of \$40,000 in source encapsulation costs.

Dr. Lothar Wiesner, Consultant to Leybold-Heraeus GmbH and Company, Koln, West Germany, visited to discuss details concerning  $^{137}\text{Cs}$  to be available from Waste Encapsulation and Storage Facility at Richland, Washington. He was advised that the facility was not in operation and that he should write a letter requesting further information and we would try to obtain answers for him.

## PUBLICATIONS

### REPORTS

J. H. Gillette, *Radioisotope Program Progress Report for November 1973*, ORNL-TM-4435, Oak Ridge National Laboratory.

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