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RADIOISOTOPE DISTRIBUTION PROGRAM PROGRESS REPORT FOR OCTOBER 1973

J. H. Gillette

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Contract No. W-7405-eng-26
ISOTOPES DEVELOPMENT CENTER

RADIOISOTOPE DISTRIBUTION PROGRAM
PROGRESS REPORT FOR OCTOBER 1973

J. H. Gillette

Work Sponsored by
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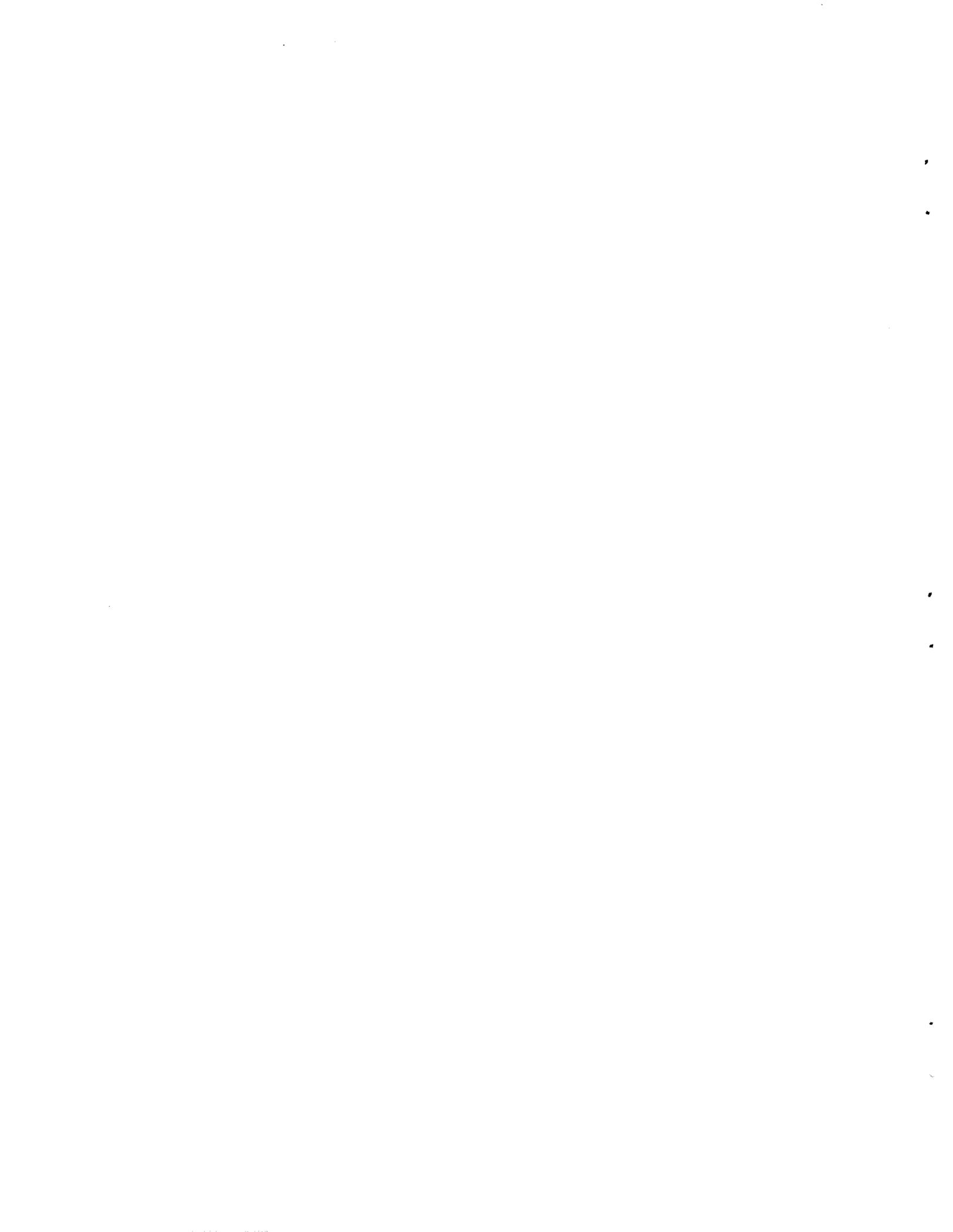
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RADIOISOTOPE DISTRIBUTION PROGRAM
PROGRESS REPORT FOR OCTOBER 1973

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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	22.127
Copper-67	24.07
Zinc-69m	250.2
Hafnium-181	0.0

ACCELERATOR-PRODUCED ISOTOPES

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

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

Table 1. Cyclotron Irradiations and Runs for October 1973

Date	Customer	Product	Target	Total Time (hr:min)	Total Charges
<u>ORNL Programs</u>					
9-26-73	ORAU and Others	Gallium-67	Zinc-68	9:00	\$ 862
10-1-73	Isotopes Division	Neodymium-146 Oxide	Promethium-146	8:45	863
10-10-73	Isotopes Division	Cadmium	Indium-111	1:45	173
10-10-73	Isotopes Division	Erbium-168 Oxide	Thulium-167	3:30	345
10-12-73	ORAU and Others	Gallium-67	Zinc-68	9:00	862
10-22-73	Isotopes Division	Bismuth-206	Lead-207	<u>1:55</u>	<u>189</u>
				33:55	\$3294

FISSION PRODUCTS

Krypton-85 Enrichment (*L. L. Leavell*)

There has been no appreciable change in completed craft work associated with renovation of the facility. The contractor's estimate for installation of the chilled water unit was received and was ~\$10,000 more than expected. A solution to this problem is being pursued. Word was received from the vendor that delivery of the chilled water unit will be further delayed until December 23, 1973.

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

1. Process Status

The ^{137}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</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

Fabrication Summary

	October 1973		CY 1973		FY 1974	
	No.	Ci	No.	Ci	No.	Ci
Sources						
Fabricated	7	7,615	35	44,955	25	22,155
Shipped	12	317	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}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	108,000	c

^aHolding for receipt of customer's container.

^bHolding for request for shipment.

^cTo be scheduled upon receipt of final details.

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

1. Process Status

The ^{90}Sr process equipment is in standby condition.

Decontamination efforts were concentrated on the cesium and rare-earth processing cells during October. Activity levels in the decontamination solutions were reduced from 1000 Ci/batch to <100 mCi/batch. The major activity was ^{137}Cs . The analytical cell servicing the rare-earth solvent extraction equipment was decontaminated and stripped of all process piping. The cell was sealed after decontamination efforts reduced the general background to 150 mr/hr and the smear level to <10 mr/hr. Miscellaneous "hot" spots of 5 R/hr remain to be removed or shielded.

A firm order for 150,000 Ci of high-grade ^{90}Sr is being negotiated with Teledyne-Isotopes. The processing of ^{90}Sr feed solution to meet this commitment will require the decontamination of a ^{90}Sr powder handling cell and the replacement of an inner pane of the cell window. The present schedule calls for decontamination and repair of Cell 12 to be completed by January 1974. With the startup of ^{90}Sr processing in January 1974, it is advisable to continue the conversion of ^{90}Sr feed solution to distrontium titanate and store all inventory materials

in the powder form. This processing cycle should be completed by June 30, 1974. The major portion of the decontamination effort will be diverted to this project starting November 1, 1973. Some minor decontamination will continue on the ^{137}Cs process cells.

Product Inventory

<u>Inventory Material</u>	<u>Amount (Ci)</u>
Feed solution ($\pm 25\%$) ^a	690,800
^{90}Sr titanate products ($\pm 10\%$)	87,200
"AGN" liners	145,500
SNAP-7F sources	115,200
RCA source	62,400
^{90}Sr silicate powder	30,500
Recovery material	25,400
Stock powder cans	<u>6,700</u>
 Total	 1,163,700
Less SNAP material purchase ^b	<u>277,400</u>
 Total Inventory Material	 886,300
<hr/>	
<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>
 Total Non-Inventory Material	 914,000
<hr/>	
TOTAL INVENTORY AND NON-INVENTORY MATERIAL	1,800,300

^aIncludes 200,000 Ci having power density sufficiently high for heat sources.

^bStrontium-90 purchased under DRRD program and retained in solution form.

Fabrication Summary

	<u>October 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	72	1,700	0	0

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

^aAll 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	40
Fission products	1	40

Promethium-147 Shipments and Current Orders

Donald W. Douglas Laboratories has ordered 50,000 Ci of ¹⁴⁷Pm to be shipped December 1973 from Richland, Washington.

RADIOISOTOPE SALES

J. E. Ratledge

An order was received from Teledyne-Isotopes for three ⁹⁰Sr sources each containing ~350 W for a total of 155,000 Ci. An order was received from Isomedix, Inc., for 36 BNL strip-type sources containing ~108,000 Ci of ¹³⁷Cs. An order was received from General Electric Company, St. Petersburg, Florida, for 230 Ci of ⁸⁵Kr.

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>		
White Sands Missile Base	Cesium-137	14,224 Ci
Technical Operations, Inc.	Cesium-137	335 Ci
New England Nuclear Corporation	Tritium	10,000 Ci
Donald W. Douglas Laboratories	Promethium-147	50,000 Ci
<u>Withdrawn Items</u>		
Cleveland Metropolitan General Hospital	Iodine-131	50 mCi
University of Pittsburgh	Iodine-131	50 mCi
University of Rochester	Iodine-131	100 mCi
PRNC	Iodine-131	15 mCi
Mayo Clinic	Copper-67	13 mCi
<u>Items Used in Cooperative Programs</u>		
Oak Ridge Associated Universities	Gallium-67	650 mCi
Oak Ridge Associated Universities	Bismuth-206	10 mCi
Oak Ridge Associated Universities	Thulium-167	10 mCi
Vanderbilt University	Bismuth-206	10 mCi
National Institute of Health	Potassium-43	10 mCi
Johns Hopkins University	Potassium-43	2 mCi
University of South Carolina	Platinum-195m	6 mCi

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

Table 2. Radioisotope Sales and Shipments

<u>Item</u>	<u>7-1-72 thru</u> <u>9-30-72</u>	<u>7-1-73 thru</u> <u>9-30-73</u>
Inventory items	\$ 85,561	\$115,924
Major products	13,955	29,280
Radioisotope services	30,053	44,663
Cyclotron irradiations	24,658	24,117
Miscellaneous processed material	16,099	12,198
Packing and shipping	<u>15,975</u>	<u>15,647</u>
Total	\$186,301	\$241,829
Number of Shipments	510	475

ADMINISTRATION

Visitors to the IDC are given in Table 3.

Table 3. Visitors to IDC

Visitor	Affiliation	Purpose of Visit
H. A. O'Brien	LASL	To discuss isotope storage, packaging, and shipping; visit FPDL and isotope process area
J. W. Barnes	LASL	
A. E. Ogard	LASL	

PUBLICATIONS

REPORTS

J. H. Gillette, *Radioisotope Program Progress Report for September 1973*, ORNL-TM-4388, Oak Ridge National Laboratory.



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