ORNL/TM-7047

Radioisotope Distribution Program Progress Report for July 1979

E. Lamb

OAK RIDGE NATIONAL LABORATORY
OPERATED BY UNION CARBIDE CORPORATION · FOR THE DEPARTMENT OF ENERGY

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RADIOISOTOPE DISTRIBUTION PROGRAM PROGRESS REPORT FOR JULY 1979

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OAK RIDGE NATIONAL LABORATORY
Oak Ridge, Tennessee 37830
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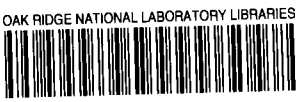

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Information is reported on new production inventory status, operational problems, and radioisotope sales.

RADIOISOTOPE PRODUCTION AND MATERIALS

Reactor Products Production *(R. W. Schaich)*

Processed Units	
Radioisotope	Amount (mCi)
Calcium-47	22

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

Five customer irradiation units and ten ORNL HFIR units (RB) containing 108,000 Ci of ^{192}Ir at HFIR discharge date were processed during the month of July, 1979. Twenty-five shipments containing 156,000 Ci of ^{192}Ir were made during this period.

Cyclotron Service Irradiations *(M. R. Skidmore)*

During July, 1979, the ORNL 86-Inch Cyclotron operated 10:15 hours for ORNL and Oak Ridge DOE programs for total charges of $1,663. Non-ORNL irradiations were 98:15 hours for total charges of $19,170.

Repairs required due to the accidental breaching of the vacuum header by a maintenance worker on June 21 were completed July 8. A gallium-67 run was terminated July 9 due to a faulty ion source. A carbon-11 run was interrupted on July 12 due to a leaking o-ring on the target dolly.

Cesium-137 Production *(R. W. Schaich)*

Processing of a WESF container of ^{137}CsCl for the Terrestrial Radioisotope Application program was completed. The ^{137}CsCl product inventory follows:

Product Inventory

(Decay calculated through August 31, 1978)

Inventory Material	Amount (Ci)
Cesium-137 chloride powder	5,700
Total Inventory Material	5,700
Non-Inventory Material	
Reject pellets and sources	4,300
Special form cans	4,000
Material returned or stored for customer	
J. L. Shepherd	62,620
New England Nuclear Corporation	1,785
Puerto Rico Sources	7,700
Lockheed	19,100
AECL powder	6,800
Radiation Resources	12,500
Gamma Industries	8,200
Minn. Mining & Mfg. Co.	10,000
Total Non-Inventory Material	137,005

Fabrication Summary

	July 1979		CY 1979		FY 1979	
	No.	Ci	No.	Ci	No.	Ci
Sources						
Fabricated	0	0	29	45,280	29	45,280
Shipped	0	0	29	45,280	45	60,540
Special Form Cans						
Fabricated	0	0	0	0	0	0
Shipped	0	0	8	2,590	10	4,590

Strontium-90 Production *(R. W. Schaich)*

The status of ^{90}Sr is given in the table below.

Product Inventory

(Decay calculated through August 31, 1978)

Inventory Material	Amount (Ci)
^{90}Sr titanate powder (±5%)	0
Sources in fabrication	0
Stock powder cans	2,950
Stock solution	180
Total Inventory Material	3,130
Non-Inventory Material	
^{90}Sr Fluoride	60,000
New England Nuclear Corporation	175
Calorimeter Standards	4,700
Weather Bureau Source	11,100
SNAP-7B	152,500
SNAP-7C	24,000
SNAP-7D	139,500
SNAP material purchase	126,700
Total Non-Inventory Material	518,675
TOTAL INVENTORY AND NON-INVENTORY MATERIAL	521,805

Fabrication Summary

	July 1979		CY 1979		FY 1979	
	No.	Ci	No.	Ci	No.	Ci
Sources						
Fabricated	0	0	0	0	4	153,000
Shipped	0	0	0	0	4	153,000
Special Form Cans						
Fabricated	0	0	0	0	0	0
Shipped	0	0	1	10	1	10

Short-Lived Fission Production *(H. Bailey)*

The modification of the Short-Lived Fission Product Facility proceeded on schedule. The maintenance phase of this operation was completed July 15, 1979. Tentative startup date is August 6, 1979.

Krypton Enrichment Facility *(J. R. DeVore)*

The south bank of the ^{85}Kr Thermal Diffusion Columns (TDC) operated according to design during the reporting period. The north bank of ^{85}Kr TDC remains shut down as an energy conservation measure.

Tritium Operations *(J. R. DeVore)*

Ten gas cylinders and fourteen nonreturnable containers were loaded with 116,000 Ci of tritium for shipment to customers. A tritium monitor system has been installed in the cell ventilation duct to monitor discharges during operations. Preliminary data indicate <1 Ci per day discharge of tritium gas.

A safety analysis report for this facility has been delayed until the tritium contamination problem is resolved. A design for a uranium trap container for shipment of tritium has been initiated. The piping design for a new tritium handling system is now scheduled to be completed in August, 1979.

The tritium exposure to operating personnel has been reduced to acceptable levels. The contaminated floor will be replaced with a urethane floor covering in August.

Krypton-85 Operations *(J. R. DeVore)*

Twenty-three gas cylinders were loaded with 896 Ci of ^{85}Kr for shipment to customers.

Packing and Shipping *(R. D. Johnston)*

One hundred and seventy-four packages were processed and shipped during the reporting period. The total weight shipped was 72,600 pounds.

Radioactive Solid Shipments	Radioactive Gas Shipments	Radioactive Liquid Shipments	Empty Containers	Total
52	47	60	15	174

Alpha Handling Facility *(R. D. Johnston)*

Seven packages of alpha-emitting material were prepared for shipment. Shipments of ten grams of ^{237}Np and six packages of ^{242}Pu were made to customers during July.

FPDL Operations *(F. V. Williams)*

Cell 10W was cleaned and one can of ^{244}Cm was transferred to Building 3038. The can had no number.

Cell 10W was prepared for ^{147}Pm loading.

The conversion of $^{137}Cs_2CO_3$ to pollucite and the hot pressing of ^{137}Cs pollucite pellets were completed. The pellets and excess cesium powders were canned and stored in Cell 13.

The purification of ^{137}Cs powder from WESF for production of teletherapy sources for AECL was begun.

Miscellaneous *(R. W. Schaich)*

A new ^{133}Xe loadout system was installed and tested at the end of the month.

The design of an electropolisher system for FPDL decontamination operations was completed at the end of March. Installation of this equipment has been delayed until 1980. Estimated costs were not available in July.

The fabrication of 23 new containers for use in the ^{85}Kr and tritium business is in progress. Delivery is now scheduled for August, 1979. The design of a ^{85}Kr purification system has been initiated.

A new tritium cylinder decontamination station was designed and fabrication initiated in the P&E shops. Completion of this station is scheduled for September, 1979.

RADIOISOTOPE SALES

J. E. Ratledge

Shipments made during the month that may be of interest are listed below:

Customer	Isotope	Amount
Large Quantities		
Gollob Analytical Service	Tritium	1,000 Ci
ICN	Tritium	2,000 Ci
Merz & Benteli Nuclear	Tritium	90,000 Ci
New England Nuclear	Tritium	14,000 Ci
Radiochemical Centre Ltd.	Tritium	10,000 Ci
Saunders-Roe Development Ltd.	Tritium	60,000 Ci
Airco Cryoplants	Krypton-85	125 Ci
Battelle Northwest	Krypton-85	100 Ci

Customer	Isotope	Amount
Withdrawn Items		
ORNL Chemistry Division	Carbon-14	1,000 mCi
ORNL Chemical Technology Division	Iodine-131	631 μCi
Mallinckrodt, Inc.	Selenium-75	3.9 Ci
Items Used in Cooperative Programs		
Univ. of So. California	Platinum-195m	7 mCi
University of Kentucky	Platinum-195m	20 mCi

The radioisotope sales and shipments for the first ten months of fiscal year 1978 and fiscal year 1979 are given in Table 1.

Table 1. Radioisotope Sales and Shipments

Item	10/1/77 through 7/31/78	10/1/78 through 7/1/79
Inventory Items	$ 118,870	$ 224,578
Tritium	1,404,948	1,613,680
Major Products	470,170	395,069
Iridium-192	740,886	1,165,523
Radioisotope Services	222,280	296,712
Cyclotron Irradiations	235,247	385,486
Miscellaneous Processed Material	177,529	10,914
Packing and Shipping	179,505	154,170
Total	$3,549,435	$4,246,132
Number of Shipments	2,160	1,802

PUBLICATIONS

Reports

E. Lamb, *Radioisotope Distribution Program Progress Report for June, 1979*, ORNL/TM-7010, Oak Ridge National Laboratory (August, 1979).

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