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Radioisotope Distribution Program Progress Report for August 1979

E. Lamb



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OPERATIONS DIVISION

RADIOISOTOPE DISTRIBUTION PROGRAM
PROGRESS REPORT FOR AUGUST 1979

E. Lamb

Work Sponsored by
DOE Office of Health and
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CONTENTS

	<u>Page</u>
SUMMARY	1
RADIOISOTOPE PRODUCTION AND MATERIALS	1
Reactor Products Production	1
Iridium-192 Production	1
Cyclotron Service Irradiations	1
Cesium-137 Production	2
Strontium-90 Production	2
Short-Lived Fission Product Production	3
Krypton Enrichment Facility	4
Tritium Operations	4
Krypton-85 Operations	4
Packing and Shipping	4
Alpha Handling Facility	5
FPDL Operations	5
Miscellaneous	5
RADIOISOTOPE SALES	5
PUBLICATIONS	7
Reports	7

RADIOISOTOPE DISTRIBUTION PROGRAM
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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*)

<u>Processed Units</u>	
<u>Radioisotope</u>	<u>Amount (mCi)</u>
Calcium-47	18

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

Five customer irradiation units and ten ORNL HFIR units (RB) containing 113,000 Ci of ^{192}Ir at HFIR discharge date were processed during the month of August, 1979. Eighteen shipments containing 97,000 Ci of ^{192}Ir were made during this period.

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

During August, 1979, the ORNL 86-Inch Cyclotron operated 18:20 hours for ORNL and Oak Ridge DOE programs for total charges of \$2,905.83. Non-ORNL irradiations were 145:15 hours for total charges of \$27,962.00. Isotope Sales Inventory irradiations were 63:15 hours for total charges of \$9,262.00.

A cobalt run on August 1 was interrupted due to the rupture of a cooling water hose to the target. On August 5 the startup of a gallium-67 run was delayed due to the failure of an electrical connection on the RF oscillator tube. On August 10 a potentially hazardous condition was discovered before serious damage resulted. Maintenance personnel, while installing a scaffold in the cyclotron area, accidentally disabled the controller on the cooling water system, resulting in the temperature rising in the cyclotron until discovered. On August 12 a short in the F-134 current limiter tube in the RF system resulted in a delay in the startup of a gallium-67 run. A cobalt-57 run was interrupted on August 22 due to the short circuiting of an electrical cable in the current limiter cubicle of the oscillator system.

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

Processing of two WESF containers of $^{137}\text{CsCl}$ (130,000 Ci) for AECL is in progress. The $^{137}\text{CsCl}$ product inventory follows:

Product Inventory

(Decay calculated through August 31, 1979)

<u>Inventory Material</u>	<u>Amount (Ci)</u>
Cesium-137 chloride powder	8,450
Best Ind. Source	<u>2,000</u>
Total Inventory Material	10,450
<u>Non-Inventory Material</u>	
Reject pellets and sources	9,050
Special form cans	3,900
Material returned or stored for customer	
J. L. Shepherd	60,700
New England Nuclear Corporation	1,500
Puerto Rico Sources	7,500
Lockheed	18,800
AECL powder	6,600
Radiation Resources	12,300
Gamma Industries	8,000
Minn. Mining & Mfg. Co.	<u>9,900</u>
Total Non-Inventory Material	138,250
TOTAL INVENTORY AND NON-INVENTORY MATERIAL	148,700

Fabrication Summary

	<u>Aug. 1979</u>		<u>CY 1979</u>		<u>FY 1979</u>	
	<u>No.</u>	<u>Ci</u>	<u>No.</u>	<u>Ci</u>	<u>No.</u>	<u>Ci</u>
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	1	120	9	2,710	11	4,710

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

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

Product Inventory

(Decay calculated through August 31, 1979)

<u>Inventory Material</u>	<u>Amount (Ci)</u>
⁹⁰ Sr titanate powder (±5%)	0
Stock powder cans	2,850
Stock solution	<u>170</u>
Total Inventory Material	3,020
<u>Non-Inventory Material</u>	
⁹⁰ Sr Fluoride	68,500
New England Nuclear Corporation	170
Calorimeter Standards	3,800
Weather Bureau Source	10,800
SNAP-7B	148,800
SNAP-7C	136,100
SNAP material purchase	<u>123,600</u>
Total Non-Inventory Material	515,170
TOTAL INVENTORY AND NON-INVENTORY MATERIAL	518,190

Fabrication Summary

	<u>Aug. 1979</u>		<u>CY 1979</u>		<u>FY 1979</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	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 startup of the Short-Lived Fission Product Facility proceeded on schedule. Xenon-133 production had some minor startup problems but these have been resolved, and ¹³³Xe is on a routine schedule of processing every other week.

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

The north bank of ^{85}Kr Thermal Diffusion Columns (TDC) remains shut down as an energy conservation measure. During this report period, leak testing and repairs were initiated on the north bank to place it in operation if additional capacity is required in the future.

The south bank operated normally until 8/23/79 when the three columns were shut down and unloading was begun. The center of C column, which should contain the 40% enriched material, was unloaded first and no problems were encountered. Tails were removed from the other two columns. Unloading should be complete by mid-September.

Design of the enriched ^{85}Kr storage and sampling system is approximately 95% complete. Removal of the old storage equipment has not been started due to lack of manpower.

Tritium Operations (*J. R. DeVore*)

Tritium exposure levels have been reduced to acceptable levels. The preliminary safety analysis report work has again started, with publication still anticipated by 1/1/80.

Installation of the urethane floor covering was completed.

Engineering has released design drawings of the tritium handling system, with the exception of the piping and instrumentation portions which should be completed in September.

The tritium duct monitor was calibrated, but sample results are not yet available.

Twelve gas cylinders, one glass ampule, and ten nonreturnable containers were loaded with 157,000 Ci of tritium for shipment to customers.

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

Twenty-eight gas cylinders were loaded with 1,130 Ci of ^{85}Kr for shipment to customers.

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

One hundred and ninety-one packages were processed and shipped during the reporting period. The total weight shipped was 199,000 pounds.

<u>Radioactive Solid Shipments</u>	<u>Radioactive Gas Shipments</u>	<u>Radioactive Liquid Shipments</u>	<u>Empty Containers</u>	<u>Total</u>
52	47	60	15	174

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

Two packages of alpha-emitting material was prepared for shipment--one 10-gram shipment of ^{238}Pu and one package of ^{242}Pu .

FPDL Operations (*F. V. Williams*)

The equipment for loading $^{147}\text{Pm}_2\text{O}_3$ powder into capsules was installed in Cell 10, and 79 inner capsules were loaded--of which 49 capsules were cleaned and prepared for seal welding and loading into the outer capsules.

The dismantling of Cell 19, a steel-shielded cell atop the main cell block, was begun.

Miscellaneous (*R. W. Schaich*)

A new ^{133}Xe loadout system was placed in operation during the month. Minor shielding will be added to reduce personnel exposure.

The design of an electropolisher system for FPDL decontamination operations was completed. Installation of this equipment has been delayed until 1980. Estimated costs for this project are \$224,000.

The fabrication of 23 new containers for use in the ^{85}Kr and tritium business is ~75% complete. Delivery is now scheduled for October, 1979.

An engineering work order for preliminary planning and cost estimate for decommissioning Building 3505 is progressing on schedule.

A new tritium cylinder decontamination station was designed and fabrication initiated in the Plant and Equipment 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:

<u>Customer</u>	<u>Isotope</u>	<u>Amount</u>
<u>Large Quantities</u>		
Battelle Northwest	Krypton-85	100 Ci
Radiochemical Centre, Ltd.	Krypton-85	100 Ci
Trio Tech International	Krypton-85	250 Ci
Minnesota Mining & Manufacturing	Promethium-147	1,000 Ci
Radiochemical Centre, Ltd.	Promethium-147	4,848 Ci
Radium-Chemie Ltd.	Promethium-147	1,008 Ci
Gollob Analytical Service	Tritium	1,000 Ci
ICN Pharmaceuticals	Tritium	2,000 Ci
Lawrence Livermore Laboratory	Tritium	7,739 Ci
Merz & Benteli Nuclear	Tritium	30,000 Ci
New England Nuclear	Tritium	8,000 Ci
Radium-Chemie	Tritium	30,000 Ci
Saunders-Roe Development	Tritium	60,000 Ci
Self-Powered Lighting	Tritium	16,000 Ci
United States Radium Corporation	Tritium	10,000 Ci

Withdrawn Items

ORNL Dept. of Quality Assurance and Inspection	Iodine-131	81 mCi
ORNL Chemical Technology	Iodine-131	10 mCi
New England Nuclear	Carbon-14	10 Ci

Items Used in Cooperative Programs

UCLA	Platinum-195m	1.5 mCi
University of Kentucky	Platinum-195m	20 mCi

The radioisotope sales and shipments for the first eleven 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 8/31/78	10/1/78 through 8/31/79
Inventory Items	\$ 153,799	\$ 249,467
Tritium	1,551,816	1,712,851
Major Products	523,473	447,440
Iridium-192	845,511	1,296,125
Radioisotope Services	270,139	312,942
Cyclotron Irradiations	304,468	421,488
Miscellaneous Processed Materials	206,195	68,469
Packing and Shipping	201,115	167,115
Total	\$4,056,516	\$4,675,897
Number of Shipments	2,410	1,939

PUBLICATIONS

Reports

E. Lamb, *Radioisotope Distribution Program Progress Report for July, 1979*, ORNL/TM-7047, Oak Ridge National Laboratory (in press).



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