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Radioisotope Distribution Program Progress Report for September 1977

E. Lamb



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OPERATIONS DIVISION

RADIOISOTOPE DISTRIBUTION PROGRAM
PROGRESS REPORT FOR SEPTEMBER 1977

Date Published - November 1977

E. Lamb

Work Sponsored by
DOE Division of Biomedical and
Environmental Research

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OAK RIDGE NATIONAL LABORATORY
Oak Ridge, Tennessee 37830
operated by
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RADIOISOTOPE DISTRIBUTION PROGRAM
PROGRESS REPORT FOR SEPTEMBER 1977

E. Lamb

SUMMARY

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

RADIOISOTOPE PRODUCTION AND MATERIALS DEVELOPMENT

REACTOR-PRODUCED RADIOISOTOPES

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

| <u>Processed Units</u> | |
|------------------------|---------------------|
| <u>Radioisotope</u> | <u>Amount (mCi)</u> |
| Calcium-47 | 35 |

ACCELERATOR-PRODUCED ISOTOPES

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

September 1977 ORNL 86-Inch Cyclotron runs for ORNL and non-ORNL programs are given in Table 1.

Table 1. Cyclotron Irradiations and Runs for September 1977

| Date | Customer | Product | Target | Total Time (hr:min) | Total Charges |
|--------------------------|---------------------|------------|-------------|------------------------|------------------|
| <u>ORNL Programs</u> | | | | | |
| 9- 6-77 | ORAU | Carbon-11 | Boron Oxide | 5:45 | \$ 688 |
| 9-21-77 | ORAU | Carbon-11 | Boron Oxide | 4:30 | 543 |
| 9-23-77 | ORAU | Carbon-11 | Boron Oxide | 5:30 | 659 |
| | | | | 15:45 | \$ 1,890 |
| <u>Non-ORNL Programs</u> | | | | | |
| 9- 1-77 | New England Nuclear | Cobalt-57 | Nickel-58 | 51:15 | \$ 8,784 |
| 9- 9-77 | New England Nuclear | Cobalt-57 | Nickel-58 | 51:15 | 8,892 |
| 9-14-77 | New England Nuclear | Cobalt-57 | Nickel-58 | 51:15 | 9,021 |
| 9-20-77 | New England Nuclear | Gallium-67 | Zinc-68 | 57:15 | 8,780 |
| 9-26-77 | New England Nuclear | Gallium-67 | Zinc-68 | 47:15 | 7,280 |
| | | | | 258:15 | \$42,757 |

Cyclotron Operations

In addition to the routine maintenance of the cyclotron, the 600 ampere rectifier supplying d.c. for the ion source was replaced due to water damage. The water damage resulted from the rupture of a cooling water hose due to the malfunctioning of a backup demineralized water pump supplying the building. Replacement and testing of the rectifier required three days. Another short delay to the startup of a run was caused by the malfunctioning of the current limiter ampere meter in the bias circuit which appeared as sparking in the cyclotron tank until it was noted that the problem was due to the malfunctioning meter.

FISSION PRODUCTS

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

Five of the ^{85}Kr enrichment columns were operative during the month of September and all the units were functioning according to design. Two columns in the south bank were unloaded during September, 1977. Expected yield on one of these columns should be >20% enrichment in ^{85}Kr . Analysis of products will be reported next month. One column in the north bank that was shut down due to an electrical overload in the chilled water compressor system was restarted. The last column in the south bank and two columns in the north bank are scheduled for unloading in October, 1977.

Cesium-137 Pilot Production (*R. W. Schleich*) (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>30,200</u> |
| <u>Total Inventory Material</u> | <u>30,200</u> |

| <u>Non-Inventory Material</u> | <u>Amount (Ci)</u> |
|--|--------------------|
| Special Form Cans | 4,300 |
| Material returned or stored for customer | |
| Nuclear Research Corporation | 0 |
| J. L. Shepherd | 50,600 |
| New England Nuclear Corporation | 2,700 |
| Puerto Rico Sources | 7,900 |
| Lockheed | 19,600 |
| AECL powder | 71,500 |
| Radiation Resources | 19,800 |
| Minn. Mining & Mfg. Company | 2,800 |
| Gamma Industries | 8,400 |
| <u> Total Non-Inventory Material</u> | <u>187,600</u> |
| TOTAL INVENTORY AND NON-INVENTORY MATERIAL | 217,800 |

Fabrication Summary

| | <u>Sept. 1977</u> | | <u>CY 1977</u> | | <u>FY 1977</u> | |
|-------------------|-------------------|-----------|----------------|-----------|----------------|-----------|
| | <u>No.</u> | <u>Ci</u> | <u>No.</u> | <u>Ci</u> | <u>No.</u> | <u>Ci</u> |
| Sources | | | | | | |
| Fabricated | 9 | 1,080 | 14 | 16,926 | 31 | 17,226 |
| Shipped | 9 | 1,080 | 17 | 35,555 | 76 | 50,493 |
| Special Form Cans | | | | | | |
| Fabricated | 1 | 2,050 | 1 | 2,050 | 1 | 2,050 |
| Shipped | 1 | 2,050 | 13 | 7,500 | 13 | 7,500 |

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. Schaich*)
(Production and Inventory Accounts)

1. Process Status

The generator loading of three ⁹⁰Sr heat sources for Sentinel-8 generators (Teledyne Energy Systems) was completed on September 2, 1977 and the units were shipped to the customer.

Product Inventory

(Decay calculated through August 31, 1977)

| <u>Inventory Material</u> | <u>Amount (Ci)</u> |
|--|--------------------|
| ⁹⁰ Sr titanate powder (±5%) | 0 |
| Sources in fabrication | 0 |
| Stock powder cans | 3,325 |
| Stock solution | <u>200</u> |
| <u>Total Inventory Material</u> | <u>3,525</u> |

| <u>Non-Inventory Material</u> | <u>Amount (Ci)</u> |
|-------------------------------------|--------------------|
| Batch 26Sr-74RE | 7,900 |
| Calorimeter Standards | 4,800 |
| Weather Bureau source | 11,400 |
| SNAP-7B | 156,300 |
| SNAP-7C | 24,600 |
| SNAP-7D | 143,000 |
| SNAP material purchase ^a | 248,300 |
| AGN-4 | <u>38,400</u> |
| <u>Total Non-Inventory Material</u> | <u>634,700</u> |

| | |
|--|---------|
| TOTAL INVENTORY AND NON-INVENTORY MATERIAL | 638,225 |
|--|---------|

^aStrontium-90 purchased under DRRD program.Fabrication Summary

| | <u>Sept. 1977</u> | | <u>CY 1977</u> | | <u>FY 1977</u> | |
|-------------------|-------------------|-----------|----------------|-----------|----------------|-----------|
| | <u>No.</u> | <u>Ci</u> | <u>No.</u> | <u>Ci</u> | <u>No.</u> | <u>Ci</u> |
| Sources | | | | | | |
| Fabricated | 3 | 157,000 | 3 | 157,000 | 3 | 157,000 |
| Shipped | 3 | 157,000 | 4 | 177,000 | 4 | 177,000 |
| Special Form Cans | | | | | | |
| Fabricated | 0 | 0 | 0 | 0 | 0 | 0 |
| Shipped | 0 | 0 | 2 | 20 | 2 | 20 |

Short-Lived Fission Production (*R. W. Schaiach*)
(Production and Inventory Accounts)

| <u>Isotope</u> | <u>Number of Batches</u> | <u>Amount (Ci)</u> |
|----------------------|--------------------------|--------------------|
| Xenon-133 | 3 | 2600 |
| Zirconium/Niobium-95 | 1 | 50 |

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 | 8,000 Ci |
| Self-Powered Lighting, Ltd. | Tritium | 4,000 Ci |
| American Atomics Corporation | Tritium | 15,000 Ci |
| Texas Instrument, Inc. | Tritium | 1,500 Ci |
| Schwarz/Mann | Tritium | 1,500 Ci |

Items Used in Cooperative Programs

| | | |
|-----------------------------------|---------------|---------|
| University of Kentucky | Platinum-195m | ~40 mCi |
| University of Southern California | Platinum-195m | 10 mCi |

The radioisotope sales and shipments for October 1975 through September 1976 and the 12 months of fiscal year 1977 are given in Table 2.

Table 2. Radioisotope Sales and Shipments

| <u>Item</u> | <u>10-1-75 thru 9-30-76</u> | <u>10-1-76 thru 9-30-77</u> |
|-----------------------------------|---------------------------------|---------------------------------|
| Inventory items | \$ 351,386 | \$ 479,800 |
| Major products | 54,386 | 109,847 |
| Radioisotope services | 163,469 | 250,386 |
| Cyclotron irradiations | 207,289 | 314,222 |
| Miscellaneous processed materials | 48,590 | 102,485 |
| Packing and Shipping | <u>111,817</u> | <u>194,584</u> |
| Total | \$ 936,937 | \$ 1,451,324 |
| Number of shipments | 2,133 | 2,438 |

PUBLICATIONS

REPORTS

E. Lamb, *Radioisotope Distribution Program Progress Report for August 1977*, ORNL/TM-6080, Oak Ridge National Laboratory (September 1977).



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