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Radioisotope Distribution Program Progress Report for May 1976

E. Lamb



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National Technical Information Service
U.S. Department of Commerce
5285 Port Royal Road, Springfield, Virginia 22161
Price: Printed Copy \$3.50; Microfiche \$2.25

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Contract No. W-7405-eng-26

OPERATIONS DIVISION

RADIOISOTOPE DISTRIBUTION PROGRAM
PROGRESS REPORT FOR MAY 1976

E. Lamb

Work Sponsored by
ERDA Division of Biomedical and
Environmental Research

JULY 1976

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OAK RIDGE NATIONAL LABORATORY
Oak Ridge, Tennessee 37830
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ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION



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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 | 16 |
| Copper-67 | 9 |

ACCELERATOR-PRODUCED ISOTOPES

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

May 1976 ORNL 86-Inch Cyclotron runs for ORNL and non-ORNL programs are given in Table 1.

Table 1. Cyclotron Irradiations and Runs for May 1976

| <u>Date</u> | <u>Customer</u> | <u>Product</u> | <u>Target</u> | <u>Total Time (hr:min)</u> | <u>Total Charges</u> |
|--------------------------|---------------------|----------------|---------------|--------------------------------|--------------------------|
| <u>ORNL Programs</u> | | | | | |
| 5- 5-76 | ORAU | Carbon-11 | Boron Oxide | 5:15 | \$ 642 |
| 5-10-76 | ORAU | Carbon-11 | Boron Oxide | 5:15 | 642 |
| 5-24-76 | ORAU | Carbon-11 | Boron Oxide | 5:15 | 642 |
| | | | | 15:45 | \$ 1,926 |
| <u>Non-ORNL Programs</u> | | | | | |
| 4-30-76 | New England Nuclear | Cobalt-57 | Nickel-58 | 51:15 | \$ 8,933 |
| 5- 6-76 | New England Nuclear | Rubidium-84 | Krypton-84 | 6:30 | 1,558 |
| 5- 7-76 | New England Nuclear | Germanium-68 | Gallium | 13:15 | 2,288 |
| 5-18-76 | New England Nuclear | Cobalt-57 | Nickel-58 | 51:15 | 9,031 |
| | | | | 122:15 | \$21,810 |

Cyclotron Operations

The mercury rectifiers in the cubicles (the d.c. high voltage power supplies for oscillator) were replaced with six stacks of solid state devices in 1968. On May 14, 1976, master cubicle 96 failed and all six stacks of rectifiers in the cubicle were found to have failed. The rectifiers were replaced and the rest of the cubicle was checked. We had smooth operations for the rest of the month.

FISSION PRODUCTS

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

The ⁸⁵Kr enrichment columns operated satisfactorily during the month of May. Unloading operations will be initiated after the installation of a new unloading station. This station is being designed and should be in operation by July 1976.

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

1. Process Status

The analytical data on the purified powder batches recovered from the WESF container was completed and the product powder averaged 24.4 Ci per gram. A total of 42,164 Ci was recovered from the WESF container, which represents a yield of 91.7%.

2. Operational Summary

Product Inventory

(Decay calculated through April 30, 1975)

| <u>Inventory Material</u> | <u>Amount (Ci)</u> |
|--|--------------------|
| In-Process | 0 |
| Cesium-137 chloride powder | 32,700 |
| Special form cans and Fabricated Sources | <u>9,800</u> |
| <u>Total Inventory Material</u> | <u>42,500</u> |
| | |
| <u>Non-Inventory Material</u> | <u>Amount (Ci)</u> |
| Material returned or stored for customer | |
| Puerto Rico sources | 8,200 |
| Lockheed | 20,300 |
| AECL powder | 73,800 |
| Radiation Resources | 34,600 |
| Minn. Mining & Mfg. Company | 9,500 |
| Gamma Industries | 8,600 |
| J. L. Shepherd | <u>13,400</u> |
| <u>Total Non-Inventory Material</u> | <u>168,400</u> |
| TOTAL INVENTORY AND NON-INVENTORY MATERIAL | 210,900 |

Fabrication Summary

| | May 1976 | | CY 1976 | | FY 1976 | |
|-------------------|----------|-----|---------|-------|---------|--------|
| | No. | Ci | No. | Ci | No. | Ci |
| Sources | | | | | | |
| Fabricated | 0 | 0 | 2 | 3,000 | 28 | 26,232 |
| Shipped | 0 | 0 | 2 | 3,000 | 18 | 24,032 |
| Special Form Cans | | | | | | |
| Fabricated | 0 | 0 | 42 | 4,200 | 80 | 9,100 |
| Shipped | 1 | 100 | 3 | 300 | 36 | 7,422 |

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. Schleich*)
(Production and Inventory Accounts)

1. Process Status

The ⁹⁰Sr process and manipulator cells are being decontaminated under the ERDA Decommissioning Program. The ⁹⁰Sr powder was removed from the FPD, encapsulated, and stored for future orders.

Product Inventory

(Decay calculated through April 30, 1975)

| <u>Inventory Material</u> | <u>Amount (Ci)</u> |
|---|--------------------|
| ⁹⁰ Sr titanate powder (±5%) | 476,000 |
| Sources in fabrication | 0 |
| RCA source | 57,800 |
| ⁹⁰ Sr silicate powder | 28,200 |
| Stock powder cans | 4,000 |
| <u>Total Inventory Material</u> | <u>566,000</u> |
| <u>Non-Inventory Material</u> | <u>Amount (Ci)</u> |
| FPDL recovery material | 18,200 |
| Quehanna recovery material | 44,400 |
| Weather Bureau source | 11,800 |
| SNAP-7B | 161,500 |
| SNAP-7C | 25,400 |
| SNAP-7D | 147,800 |
| SNAP material purchase ^a | 256,600 |
| <u>Total Non-Inventory Material</u> | <u>665,700</u> |
| <u>TOTAL INVENTORY AND NON-INVENTORY MATERIAL</u> | <u>1,231,700</u> |

^aStrontium-90 purchased under DRRD program.

Fabrication Summary

| | <u>May 1976</u> | | <u>CY 1976</u> | | <u>FY 1976</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 | 0 | 0 |
| Shipped | 0 | 0 | 0 | 0 | 0 | 0 |
| Special Form Cans | | | | | | |
| Fabricated | 0 | 0 | 0 | 0 | 0 | 0 |
| Shipped | 1 | 100 | 5 | 234 | 9 | 604 |

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

| <u>Isotope</u> | <u>Number of Batches</u> | <u>Amount (Ci)</u> |
|----------------|--------------------------|--------------------|
| Iodine-131 | 1 | 50 |
| Xenon-133 | 2 | 1300 |

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 | 6,000 Ci |
| American Atomics | Tritium | 6,000 Ci |
| ICN Pharmaceuticals | Tritium | 1,000 Ci |
| Saunders-Roe, England | Tritium | 5,000 Ci |
| Self-Powered Lighting | Tritium | 2,000 Ci |
| <u>Withdrawn Items</u> | | |
| K-25 Plant | Iodine-131 | 5 mCi |
| Cleveland General Hospital | Iodine-131 | 50 mCi |
| <u>Items Used in Cooperative Programs</u> | | |
| University of Southern California | Platinum-195m | 18 mCi |

The radioisotope sales and shipments for the first eleven months of FY 1975 and FY 1976 are given in Table 2.

Table 2. Radioisotope Sales and Shipments

| Item | 7-1-74 thru 5-31-75 | 7-1-75 thru 5-31-76 |
|-----------------------------------|------------------------|------------------------|
| Inventory items | \$ 342,635 | \$ 272,335 |
| Major products | 92,390 | 49,516 |
| Radioisotope services | 81,199 | 80,319 |
| Cyclotron irradiations | 90,689 | 164,801 |
| Miscellaneous processed materials | 130,701 | 51,593 |
| Packing and Shipping | <u>69,015</u> | <u>102,110</u> |
| Total | \$ 806,629 | \$ 720,674 |
| Number of shipments | 1,457 | 1,567 |

PUBLICATIONS

REPORTS

E. Lamb, *Radioisotope Distribution Program Progress Report for April 1976*, ORNL/TM-5537, Oak Ridge National Laboratory (June 1976).



INTERNAL DISTRIBUTION

- | | |
|----------------------|--------------------------------------|
| 1. E. E. Beauchamp | 12. M. E. Ramsey |
| 2. T. A. Butler | 13. J. E. Ratledge |
| 3. F. N. Case | 14. C. R. Richmond |
| 4. W. R. Casto | 15. A. F. Rupp |
| 5. J. A. Cox | 16. R. W. Schaich |
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| 11. H. Postma | 24. Document Reference Section |

EXTERNAL DISTRIBUTION

- 25. B. J. Dropesky, LASL, Los Alamos, New Mexico
- 26-27. J. H. Jarrett, PNL, Richland, Washington
- 28. D. K. Jones, Richland Operations Office, Richland, Washington
- 29. L. M. Knights, Atlantic Richfield Hanford Company, Richland, Washington
- 30. J. N. Maddox, ERDA-DBER, Washington, D. C.
- 31. W. E. Mott, ERDA-DBER, Washington, D. C.
- 32. H. A. O'Brien, LASL, Los Alamos, New Mexico
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- 34. L. G. Stang, Jr., BNL, New York
- 35-36. R. W. Wood, ERDA-DBER, Washington, D. C.
- 37. Donner Laboratory Library, University of California, Berkeley, Calif., 94720
- 38. Research and Technical Support Division, ORO
- 39-40. Technical Information Center