

## **Isotope Production and Distribution Program Fund**

### **Program Overview**

No funds are requested for the Isotope Production and Distribution Fund (Isotope Program). Each of the sites' production expenses for processing and distributing isotopes is offset by revenue generated from sales. See the Isotope Production and Applications section of the Nuclear Physics program within the Science appropriation for justification of the direct appropriations requested.

Isotopes are currently produced and processed at three facilities: Los Alamos National Laboratory, Brookhaven National Laboratory, and Oak Ridge National Laboratory. In addition, the Isotope Program is planning to use the recently installed hydraulic tube at the Advanced Test Reactor (ATR) at the Idaho National Laboratory (INL). This upgrade will provide additional capability to produce short-lived medical and scientific research isotopes in short supply. At the Pacific Northwest National Laboratory (PNNL), the isotope program will continue to distribute strontium-90, a byproduct material. For the future, the Isotope Program will consider processing other byproduct material stored at PNNL. The Isotope Program will also consider production capabilities at university facilities in the future.

### **Background**

The Isotope Program produces and sells radioactive and stable isotopes, byproducts, surplus materials, and related isotope services world wide. The Isotope Program operates under a revolving fund established by the 1990 Energy and Water Appropriations Act (Public Law 101-101), as modified by Public Law 103-316. In FY 2008, research isotopes were priced based on direct production costs. The Isotope Program is in the process of developing new pricing policies for research isotopes to make them more affordable to the research community. The DOE will continue to sell commercial isotopes at full-cost recovery.

The Program's fiscal year appropriation will be received via transfer from the Nuclear Physics program starting in FY 2009. Prior to FY 2009, the direct appropriation was provided via transfer from the Radiological Facilities Management program within the Office of Nuclear Energy. The appropriation funds the scientists and engineers needed to support the isotope program, and to operate, improve and maintain isotope facilities needed to assure reliable and enhanced production. In addition, the appropriation provides for support of R&D activities associated with the development of new production and processing techniques for isotopes; operations support for the production of research isotopes; and support for the training of new personnel in isotope production and development.

The combination of the annual direct appropriation and revenues from isotope sales are deposited in the Isotope Production and Distribution Program Fund, the revolving fund. The fund's revenue and expenses are audited annually consistent with Government Auditing Standards and other relevant acts, such as the Chief Financial Officers Act of 1990 and the Government Performance and Results Act of 1993.

The Department has supplied isotopes and related services for more than 50 years. These isotope products and services are used by medical institutions, universities, research organizations, and industry for a wide array of uses and applications. They will also provided to many Federal agencies either directly or indirectly, including the National Institutes of Health and its grantees, the Environmental Protection Agency, and the Department of Homeland Security.

As the range of available isotopes and the recognized uses for them have increased, new or improved isotope products have contributed to progress in medical research and practice, new industrial processes, and scientific investigation. Substantial national and international infrastructure has been built around

the use of isotopes and is dependent on the Department's products and services. Isotopes are used for hundreds of research, biomedical, homeland security, and industrial applications that benefit society every day, including heart imaging, cancer therapy, smoke detectors, neutron detectors, explosive detection, oil exploration, and tracers for climate change.

Isotope applications are widely used in medical research, diagnosis, and therapies, which are a growing component of the U.S. health care system. The use of medical isotopes reduces health care costs and improves the quality of patient care. It is estimated that for one in every three people treated at a hospital, their treatment makes use of a radioisotope in their laboratory tests, diagnoses, or therapy. Each day, over 40,000 medical patients receive nuclear medicine procedures in the United States. Such nuclear procedures are among the safest diagnostic tests available. They save many millions of dollars each year in health care costs and enhance the quality and effectiveness of patient care by avoiding costly exploratory surgery and similar procedures. For example, it has been demonstrated that the use of myocardial perfusion imaging in emergency department chest pain centers can reduce the duration of stay on average from 46 hours to 12 hours. Therefore, an adequate supply of medical and research isotopes is essential to the Nation's health care system, and to basic research and industrial applications that contribute to national economic competitiveness.

Isotope uses in homeland security applications are also increasing, and include: radiation portal monitors used to find unshielded or lightly shielded radiological material; imaging systems used to find densely shielded material; systems to detect the presence of nitrogen-based chemical explosives; and other forms of explosive detection.

### **FY 2008 Accomplishments**

In FY 2008, the Isotope Program served over 190 customers including major pharmaceutical companies such as GE Healthcare and Siemens Medical Solutions; industrial users such as Spectra Gases and Frontier Technology; and hundreds of researchers at hospitals, national laboratories, universities, and private companies. There are ten high volume isotopes among the many produced by the Program. The remaining ones are low-volume, high-cost research isotopes. Generally, program sales projections are dynamic and require frequent modification. For example, over the last three years, the demand for the Department's medical isotopes has increased by more than 15%. In FY 2008, there were a total of 562 shipments made of which 25% were foreign and 4% were intra-governmental. Customer satisfaction with product specifications continues to be high. The Isotope Program ensured 100% of products and services provided met the terms of the contract/sales order.

A loss of sponsorship of the Cf-252 production program at the High Flux Isotope Reactor (HFIR) at Oak Ridge National Laboratory (ORNL) almost forced a cessation in production, as the Isotope Program could not afford to support the effort single-handedly. The Program investigated the Cf-252 cost issues and worked with ORNL staff to optimize production efficiency and minimize costs. The Program met several times with industrial representatives to understand and project long-term needs and availability of Cf-252. A path forward for ensuring future production of Cf-252 for the Nation was successfully identified.

## **Budget Overview**

For FY 2010 and the future, the Department foresees more than moderate growth in isotope demand, coupled with the possible need for new isotope products for homeland security, medicine, and industry. In order to satisfy the needs of its customers, the program seeks to meet supply requirements for year-round availability of isotopes for scientific and medical research and, in particular, for human clinical trials. The program's production capability may be called upon for initial ramp-up of production of major new isotope products until market forces bring in private producers that are willing to invest and produce the needed isotopes.