

EXECUTIVE SUMMARY

Isotopes, including both radioactive and stable isotopes, make important contributions to research, medicine, and industry in the United States and throughout the world. For nearly fifty years, the Department of Energy (DOE) has actively promoted the use of isotopes by funding (a) production of isotopes at a number of national laboratories with unique nuclear reactors or particle accelerators, (b) nuclear medicine research at the laboratories and in academia, (c) research into industrial applications of isotopes, and (d) research into isotope production and processing methods. The radiopharmaceutical and radiopharmacy industries have their origin in these DOE-funded programs. Currently, more than 12 million nuclear medicine procedures are performed each year in the United States, and it is estimated that one in every three hospitalized patients has a nuclear medicine procedure performed in the management of his or her illness.

All of this is enabled by an abundant supply of isotopes that can meet the changing needs of a vigorous and growing research community. If the widespread uses of radioactive materials are not maintained through research, it will not be possible for this country to sustain, much less expand, our high standard of living and advanced industrial economy.

Recent levels of federal appropriations, averaging about \$20 million per year, have not permitted the DOE's isotope supply to adequately keep pace with the changing needs of the research community. It is now widely conceded that limited availability of specific radionuclides is a constraint on the progress of research. The problem is especially apparent in a number of medical research programs that have been terminated, deferred, or seriously delayed by a lack of isotope availability.

The Nuclear Energy Research Advisory Committee (NERAC) convened a Subcommittee for Isotope Research and Production Planning in January 1999 to study the issue of isotope availability. The Subcommittee visited seven isotope production sites: five within the national laboratory system and two outside producers. A number of recommendations, both short- and long-term, were made regarding the supply of isotopes.

Short-Term Recommendations (the next five years)

1. Refocus the Office of Isotope Programs on the supply of radioisotopes and stable enriched isotopes for research within its mission to serve the national need for a reliable supply of isotope products and services for research, medicine, and industry.
2. Limit commercial isotope production to products where the DOE has a unique production capability and where other market supplies are not sufficient to meet U.S. demand.
3. Establish an Isotope Review Panel to review and recommend proposals to produce isotopes to the Director of Isotope Programs. The Panel should identify isotopes of interest and preferred sites for production, including alternative supply options, and provide other advice as requested.
4. Consolidate existing radioisotope processing capabilities.
5. Contract with the academic and private sectors to accomplish the primary focus and mission.
6. Expand innovative research in diagnostic and therapeutic nuclear medicine by increasing funding for the Advanced Nuclear Medicine initiative.
7. Increase the funding for academic training to support the primary focus and mission.
8. Begin conceptual design of a dedicated cyclotron to support the mission to serve the national need for a reliable supply of isotope products and services for research, medicine, and industry.

Long-Term Recommendations (the next ten years)

1. Promote the greatest synergism among the national labs, academic, and industry to fulfill the Isotope Program's mission.
2. Acquire a dedicated, single-mission, isotope production and processing facility that would be fully operational by 2010. The facility should include a cyclotron and a reactor both dedicated to isotope production based on off-the-shelf designs.
3. Maintain a stable/enriched isotope inventory for research purposes.
4. Ensure an adequately sized and properly trained work force to meet national isotope needs.
5. Implement a contingency plan to guarantee an uninterrupted radioisotope and stable isotope supply for the country's research needs.