



American Nuclear Society Issue Paper on the Nuclear Fuel Cycle and U.S. Nuclear Nonproliferation Policy

Summary

The American Nuclear Society believes that the **U.S. must vigorously pursue research and development of proliferation-resistant closed nuclear fuel cycles, as part of the development of sustainable advanced nuclear energy systems.** This can be done within existing U.S. policy on nonproliferation and civil nuclear power, and could lead to sustainable nuclear fuel supplies, while still achieving important nonproliferation goals. Only by pursuing this research can the U.S. lead the world to safer and more proliferation-resistant civil nuclear power.

Background

U.S. nonproliferation policy is set forth in Presidential Decision Directive-13 (PDD-13), dated September 27, 1993, which states that “the United States does not encourage the civil use of plutonium and, accordingly, does not engage in plutonium reprocessing for either nuclear power or nuclear explosive purposes.”

For more than 40 years, the U.S. engaged in both plutonium reprocessing for defense purposes and in programs to develop nuclear reactors that would “breed” plutonium for use in nuclear energy systems. “Breeder” reactors are reactors that can actually produce more fuel than they consume. Breeder reactor programs were pursued by the U.S., along with France, Japan, Russia, and other countries, as a way to help ensure energy independence by extending nuclear fuel supplies from a 50-100 year reserve to a reserve of more than 1000 years. Today, France, Japan, Russia, and the United Kingdom also reprocess civilian nuclear fuel to maximize the use of nuclear fuel resources in conventional reactors.

In implementing PDD-13, the U.S. Department of Energy (DOE) ceased both defense plutonium reprocessing and the development of breeder reactors. The U.S. breeder reactor programs were terminated in 1994, under the premise that by pursuing breeder reactor development, the U.S. was sending a signal to other countries that we weren’t serious about our objection to the civil use of plutonium. Despite the U.S. action, France, Japan, Russia, and other countries continued the development of breeder reactors and the use of reprocessing. Commercial reprocessing is a major international industry.

Since 1994, great strides have been made world-wide in the development of nuclear fuel recycling technologies that do not result in the separation of plutonium suitable for use in nuclear weapons. These technologies have been developed with the express purpose of greatly reducing or eliminating altogether the potential for proliferation from nuclear fuel recycling operations. These technologies could lead to the development of nuclear energy systems that produce an essentially inexhaustible supply of nuclear fuel.

The need for the U.S. to reassert its leadership in nuclear fuel cycle research was spelled out in a January 2000 report of the Center for Strategic and International Studies Project on Global Nuclear Materials Management. This Project, Chaired by former Senator Sam Nunn, concluded that “The United States has virtually disengaged from international discussions and cooperation on the future of the nuclear fuel cycle.” The report recommends that “the United States should re-engage in international discussions and R&D on safe and proliferation-resistant approaches to the fuel cycle.” This re-engagement should be conducted with

an eye toward “finding ways to better utilize limited nuclear resources and ensure adequate fuel supplies for the long-term...”

This is not to infer that commercial nuclear fuel reprocessing should be resumed in the U.S. at this time. There are no driving economic or resource issues that would prompt the U.S. today to consider commercial recycle. However, as advocated by Senator Pete Domenici, it is in the national interest to ensure that proliferation-resistant recycle technologies are available when they are needed, and to restore U.S. influence over nuclear fuel cycle decisions abroad. To achieve these important national security goals, the U.S. should resume research as part of a larger effort to develop sustainable nuclear energy systems.

Recommendation

The American Nuclear Society believes it is time for the U.S. to allow the consideration of proliferation-resistant nuclear fuel recycling technologies and nuclear power systems. This action will help ensure that proliferation-resistant recycle technologies are available when they are needed, and will give the U.S. a greater degree of influence over nuclear fuel cycle decisions made abroad. **The next Administration should acknowledge that not only can closed fuel-cycle research be conducted in a manner consistent with U.S. nonproliferation policy, it is necessary to enable effective implementation of that policy.**