

Nuclear Arsenal's Needs Create Dilemma for U.S.

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Even as the United States urges the rest of the world to extend indefinitely a treaty requiring signatories to work toward elimination of nuclear weapons, the Energy Department is planning a multibillion-dollar project to resume production of a radioactive gas used to enhance the bang of American nuclear warheads.

The department is planning to announce this summer what kind of facility it plans to build to produce the gas, tritium, and where it plans to build it. The choice is between a huge particle accelerator, using theoretically workable but untested technology, and a nuclear reactor,

which would be the first reactor ordered in the United States since the 1979 Three Mile Island nuclear accident.

Either choice involves immense political, financial, environmental and national security risks, and the issue is emotionally wrenching as well. The U.S. delegation to the 178-nation conference meeting in New York to discuss extension of the Nuclear Non-Proliferation Treaty is already under pressure from some participating countries to do more to eliminate nuclear weapons, as that treaty requires, but U.S. national security strategy presumes a continued, if diminished, reliance on a nuclear arsenal.

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Many officials of the Clinton administration are averse to nuclear power and do not want the federal government to sponsor construction of a reactor. But many career staff members in the Energy Department and the Pentagon have long supported the nuclear industry and favor the reactor method of producing the tritium needed for the weapons program, rather than what they regard as the possibly unreliable particle accelerator. Energy Secretary Hazel R. O'Leary is under intense congressional pressure to choose the reactor option and to build it at the Energy Department's Savannah River, S.C., weapons plant.

The Nuclear Weapons Council, an interagency group responsible for setting weapons policy and overseeing the arsenal, has endorsed the accelerator technology but recommended "aggressive" parallel development of a reactor as a "contingency," according to internal Energy Department memos.

The Energy Department's proposed fiscal 1996 budget includes \$50 million to begin development of a tritium source, whatever choice is made. Several combinations of site

and technology are theoretically on the table, but realistically the choice facing O'Leary appears to come down to this: invest billions of federal dollars in a particle accelerator or accept a proposal from a nuclear industry consortium to use mostly private funds to construct a reactor that would have three functions—produce tritium, generate electricity and burn plutonium fuel to begin reducing the nation's stockpile of surplus plutonium.

Proponents of the accelerator option argue that scientists have proved its viability and that building an accelerator avoids the questions of safety and of radioactive waste disposal associated with nuclear reactors. They also argue that construction of a reactor that would use plutonium as fuel, as proposed by the industry consortium, would undermine the Clinton administration's efforts to discourage other nations

from turning to plutonium as a commercial fuel.

Proponents of the reactor say the proposed multi-purpose reactor's design has been judged safe by the Nuclear Regulatory Commission and that the privately-owned reactor would cost the government as much as \$15 billion less than the accelerator over its planned 40-year life. In addition, they argue that only a reactor is a known, sure-fire source of tritium, which is what Congress wants.

Since the Clinton administration is already searching for an acceptable method to dispose of surplus plutonium anyway, reactor proponents argue, the Energy Department should combine the process of deciding how to produce tritium with the process of deciding how to get rid of surplus plutonium, a highly toxic man-made element that is the key component of nuclear weapons. "Ours is the only technology that can do the two together," said George A. Davis, project manager for ABB Combustion Engineering Inc., whose System 80 plus reactor would be built if the industry consortium plan is accepted. A decision by the federal government to order and build a nuclear reactor would be a significant boost for a sagging industry that has not received an order for a new plant in two decades.

"My mind is still open on the issue" of what kind of tritium source to develop, O'Leary said in an interview. She said she has to decide what method ensures the greatest reliability of a tritium supply at the lowest possible cost, and she still has not seen persuasive economic projections on either side. The surplus plutonium issue is to be decided separately and on a different timetable, she said.

Tritium is a radioactive isotope of hydrogen. By making nuclear explosions more powerful, it enabled bomb designers to produce smaller weapons with no loss of explosive force. Because tritium decays by 5.5 percent annually, the supply must be replenished periodically.

No replenishment would be needed if the United States were contemplating complete nuclear disarmament.

ment, but U.S. national security doctrine holds that the nation must continue to have nuclear weapons indefinitely, although the stockpile is dwindling rapidly now that the Cold War is over. The Energy Department has calculated that it can recycle enough tritium from dismantled warheads to keep the remaining stockpile viable until 2011 but is under orders from Congress to begin developing a new source to be ready by that time.

Until the late 1980s, tritium was produced through the bombardment of lithium targets with neutrons generated by nuclear reactors at Savannah River. Those reactors were shut down for safety reasons. The Bush administration developed an \$8.2 billion program to replace them with new reactors but terminated it when arms reduction agreements with Moscow eased the urgency of tritium production. The nation currently has no tritium source.

Scientists at the Los Alamos National Laboratory have concluded that a very large particle accelerator could be developed to produce tritium at a cost of about \$2.6 billion. In addition, the facility would cost \$290 million a year to operate, not counting the cost of the large quantities of electricity the accelerator would consume. By some calculations, the Energy Department would have to build a separate coal-fired power plant to supply electricity to the reactor. All those costs would presumably be borne by the taxpayers.

The industry consortium argues that its "triple-play reactor" proposal

would save the taxpayers billions because ABB and its partners would build and operate the reactor, economizing by using government-owned land, recouping their costs by selling the electricity it would generate and charging the government only \$78 million a year for plutonium disposition. The government would also pay a fee for tritium to be produced, but only when needed.

Judging from the furious public opposition to nuclear reactor construction since the 1979 Three Mile Island accident, most localities in the United States would probably oppose any new reactor proposal. But nuclear-friendly Savannah River is different. With jobs on the line, residents of Aiken, S.C., and other communities near Savannah River have expressed strong support for having such a project there.

O'Leary said she is not going to commit herself until she is satisfied she fully understands the economic implications of the competing technologies.

"We have a long history [in the Energy Department] of getting started with projects having not clearly understood the economics and then having the costs balloon on us," she said. "We are not building a facility on paper; we're building a facility to produce tritium in the timetable required. If we're wrong in the economics or wrong in the technology or wrong about the institutional barriers, we won't have accomplished our goal, which is to get a tritium source up and running."
