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U.S. Plans to Rejoin Project to Develop Fusion Reactor

By KENNETH CHANG

The United States will seek to join a \$5 billion international project to build an experimental fusion reactor, Energy Secretary Spencer Abraham announced yesterday.

"Now is the time to expand our scope and embrace international efforts to realize the promise of fusion energy," Mr. Abraham said at the Princeton Plasma Physics Laboratory in New Jersey. "Now it is time to take the next step on the way to having fusion deliver electricity to the grid."

The United States left the same project in 1998, calling it too costly and too ambitious. The design was then scaled back and the budget cut in half. Last month, a committee convened by the National Research Council recommended that the United States rejoin the project, known as the International Thermonuclear Experimental Reactor, or ITER. The participants are considering Canada, France, Spain and Japan as possible sites for the reactor.

Fusion has long been an attractive potential energy source. Using the same process that lights the sun, fusion produces energy by combining hydrogen atoms into helium. Hydrogen is readily available, and fusion reactors would not produce long-lived highly radioactive waste like current nuclear fission reactors.

But progress toward continuous, controlled fusion reactions has been slow, and even proponents believe commercial fusion power plants are decades away.

The United States would contribute about 10 percent of the construction costs of the reactor, or about \$500 million over eight years, according to a news release from the Energy Department. That would be a smaller share than at least some of the project's current partners, Russia, the European Union, Japan and Canada. China has also announced it would like to join the project.

Mr. Abraham did not indicate whether the administration's budget proposal for next year, to be released on Monday, would include an increase in financing for fusion research. Fusion research was cut by a third in 1996 and has remained flat since then at about \$250 million a year.

In his speech, Mr. Abraham said that joining ITER "in no way means a lesser role for the fusion programs we undertake here at home." He added, "It is imperative that we maintain and enhance our strong domestic research program."

Most American fusion scientists support entering ITER negotiations, but also want to continue design work on a smaller alternative reactor that the United States could build alone should the project hit additional snags.

Energy officials will attend meetings next month in St. Petersburg, Russia, where the ITER participants will discuss where the reactor will be built and how to divide the costs and responsibilities among the partners.

The reactor, even its scaled-back design, would still produce much more power than its predecessors. The Tokamak Fusion Test Reactor at the Princeton Plasma Physics Laboratory, which closed in 1997, generated a maximum of 11 megawatts of energy for one-third of a second. ITER is designed to generate up to 500 megawatts for up to an hour. That would allow examination of a regime known as "burning plasma" where most of the heating of the hydrogen gas comes from the fusion reactions, not from the electricity powering the reactor.

Construction of the reactor is scheduled to begin in 2006, with experiments starting in 2014.

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