Civilian laser fusion slated for scrap heap

by Steven Bardwell, Military Editor

A policy decision has been made by the Reagan administration to completely destroy America's civilian laser-fusion research program over the next several years. A combination of budget cuts and reallocation of funds to military research projects is in the process of leaving the United States, as a senior Energy Department official said, with no civilian laser-fusion research program.

Laser fusion is one technologies which promise unlimited, cheap, clean energy from the fusion of light atoms (usually forms of hydrogen). The other techniques used to achieve the stellar temperatures and pressures required to ignite the fusion reaction—magnetic fields and particle beams—are, along with laser-induced fusion, being pursued internationally in research programs in the Soviet Union, Europe, Japan, and, with large government-funded programs, in the United States. Currently, the United States has the largest civilian laser-fusion research program in the world, in fiscal 1981 spending $140 million dollars.

In addition to its applications to the production of electricity and process heat for civilian applications, the laser-fusion technique is used to simulate the explosion of hydrogen bombs. Although the energy from the laser-fusion reaction has no direct military use, the initial inspiration of the program (and much of its subsequent funding) has come from military research devoted to studying the high energy-density states that are created by only two terrestial processes: the explosion of a hydrogen (fusion) bomb, and the ignition of a laser-fusion target.

The civilian program

In recent years, scientists in the laser field program had become more and more optimistic about the ultimate success of the application of laser fusion to energy production. At the prestigious awards banquet of the American Physical Society's Plasma Physics Division, the leader of the research effort on laser fusion at Lawrence Livermore Laboratory, Dr. John Nuckolls, stated that recent results in laser fusion had been so promising that an Apollo-scale effort for the perfection of the technology was justified. His optimism is widely shared within the U.S. plasma physics community.

The recent successes of the U.S. program have inspired the Japanese to pursue a very aggressive laser-fusion program in parallel to their magnetic fusion program; the latter is today the world's largest in annual expenditures. By 1982, the Japanese program will have the world's largest laser in operation in laser-fusion research, since at that point, the comparable U.S. laser, the Shiva at Lawrence Livermore, will have been dismantled for budgetary reasons—its parts are being salvaged for construction of the next larger laser, the Nova, which as yet is unfunded! The Japanese laser, Gekko 12, will be 50 percent bigger than the biggest American laser in operation today. According to Dr. C. Yamanaka, the Japanese foresee a fusion reactor for export by the year 2000.

At a conference held Dec. 10 in San Francisco with Yamanaka were the heads of the French and Soviet programs, the other large laser-fusion research programs. However, the other programs were overshadowed by the demise of the U.S. program and the astounding progress of the Japanese program.

An overview of the U.S. program was provided at the conference by Dr. Richard Schreiver, Director of the Office of Inertial Confinement Fusion in the Department of Energy. For the first time in a public meeting, Schreiver gave primary emphasis to the near-term military application of the laser-fusion technology. The official position of the U.S. program had been, up until this time, that the laser-fusion program had important military applications, but was directed toward the long-term goal of civilian energy production. That this policy change is on the verge of being official was signaled by another high Department of Energy official overseeing the program, who said off the record: "We do not expect there to be an ongoing civilian laser-fusion program in the United States."

The fiscal 1981 budget for civilian laser fusion was $140 million. The fiscal 1982 budget, which has passed Congress, included an $18 million cut (in current dollars) in the laser-fusion budget, bringing the figure to $122 million. The OMB's FY83 budget, not yet publicly released, is rumored to include only $90 million for laser-fusion research for civilian application. These figures mean that the laser-fusion budget will have been cut by more than 50 percent in real spending power within two years. If this budget allocation passes, the Japanese will be spending more in absolute terms on laser fusion than the United States.

Said one Japanese scientist at the San Francisco meeting: "I hope the Americans continue with their civilian program—we benefit from international collaboration. But if the United States is so short-sighted as to do only military research, our own program will continue. We can do it by ourselves."