The end game in fusion funding

by Mark Wilsey

Each year Fusion Power Associates, FPA, hosts a meeting of representatives from the fusion research and industrial community to review the progress and future of the U.S. fusion program. In recent years the picture has been bleak, but this year's meeting, just concluded in Washington, D.C. on June 14-15, was particularly somber.

Unfortunately, the magnetic fusion program as it has been constituted over the past decade and a half, was stripped down to the Princeton Tokamak, and then to the International Test Experimental Reactor (ITER), thus, on the one hand, eliminating the more exciting scientific experiments, and on the other, failing to do the kind of materials testing which could have made a fusion reactor practical. Yet it is little short of tragedy to move further along in a direction away from the enormous potentials which can open up for mankind with this energy resource.

On June 8, the Energy and Environment subcommittee of the House Science Committee cut $136 million from the Clinton administration's FY96 request of $366 million for magnetic fusion energy research. The 38% reduction, which has been approved by the House Appropriations Committee, will shut down the Tokamak Fusion Test Reactor, TFTR, at Princeton, and halt construction of its successor, the Tokamak Fusion Experiment, TPX. It will adversely affect all other major fusion programs, according to the Department of Energy fusion office, because the cost of terminating these programs, $45 million, would have to come out of the $229 million budget. Materials R&D, plasma technology development, and other programs will also end.

Earlier, the Green Scissors report issued by the Friends of the Earth and the Taxpayers Union had targeted fusion research for elimination. At a press conference on June 7, subcommittee chairman Dana Rohrabacher (R-Calif.) stated that some "programs have a tendency to go on and on, even when no longer justified," and large-scale fusion energy projects are examples of this.

Dr. Martha Krebs, the director of the Office of Energy Research at DOE, presented to the meeting the Department's overall budget picture. DOE employment will drop by half by the turn of the century, from more than 20,000 to about 10,000. The problem, she said, with Rep. Robert Walker's (R-Pa.) proposal to have a Department of Science replace DOE, NASA, and Commerce, is that this would be "science without problems to solve"—no mission.

Walker, who chairs the House Committee on Science, gave the keynote address on June 16. Walker said that the $229 million that the committee approved for fusion was focused primarily on ITER. He said that he could not foresee any multibillion dollar program unless it involves international cooperation. "Nobody claims, least of all me, that these are bad programs," Walker said. But any program that is not going toward internationalization is going in the wrong direction.

In the question period, Walker was reminded that TPX will cost well under $1 billion, and when there is no longer a TFTR it will be the only major fusion device in America. Walker responded that at $229 million there would be enough money for TPX, if that is what the fusion community decides and that would be fine, but it would mean doing one thing to the exclusion of everything else, and that would be a big decision.

In response to a comment on the size of the U.S. fusion program compared to the Japanese and Europeans. Walker responded that you can always find someone spending more money than you, but that has to be balanced against our needs and our national interests, and now, the "moral imperative" is a balanced budget.

That afternoon Anne Davies, associate director for fusion energy at the DOE, brought breaking news to the meeting on the findings and recommendations of a panel of the President's Committee of Advisers on Science and Technology (PCAST) which had examined the U.S. fusion program. The report defended the current DOE fusion program, which had proposed $366 million in 1996 increasing to $860 million in 2002, averaging $645 million between 1995 and 2005, but said that "it does not appear to be realistic in the current climate of budgetary constraints." Therefore they put forward a plan for funding fusion at about half of this average projected amount, or a flat $320 million per year.

The plan would be to delay TPX for three years, while the U.S. would try to talk down the cost of ITER from $10-13 billion to around $4 billion, continue to operate our existing machines, and give up any hope for a demonstration fusion plant by 2025.

Even at that, the fate of TPX is still unsure, pending the outcome of the ITER renegotiations. If renegotiations allow the United States to cap its total cost on the construction of a downsized ITER, Materials Test Facility, and TPX at $1.2 billion, or if the outcome of the talks means that some form of ITER goes forward without the United States, then TPX would go ahead. Otherwise TPX would not be built without another review. PCAST concedes that a U.S. withdrawal from international collaboration could lead to the collapse of such efforts and that at funding levels of $200 million the United States could not participate in international fusion programs, much less any meaningful domestic program.

Neither the PCAST plan nor the House budget presents a viable prospect for fusion research. One provides hospice care; the other chops its head off.