

EIR Special Report

Laser technologies: industrial path to the beam-weapon era

by Paul Gallagher

Secret military-science policy meetings are currently in progress near Washington, formulating technology recommendations for the senior Interagency Task Force headed by NSC Director William Clark, which is charged with implementing President Reagan's March 23 assured-survival strategic doctrine. The new doctrine was launched by National Security Decision Directive 85, "Eliminating the Threat From Ballistic Missiles."

These meetings, coordinated by former NASA director Dr. James Fletcher, have drawn top program leaders from the U.S. national laboratories into Washington for the past weeks; on June 30 a classified briefing was held for a larger group of industrial and university experts, to seek their input and involvement in shaping the program.

Members of the task force, in public presentations over recent weeks, have made two things clear: First, the development of the necessary anti-missile beam, sensing, pointing, and guidance technologies is already well under way in our national and industrial labs, and these new defensive weapons "are much closer to realization than most people think," in the words of Presidential science advisor Dr. George Keyworth in a recent interview. Second, the basis of the program is the revolutionary technologies which perform work, *of all kinds*, by coherent radiation rather than heat-power. These are "directed-energy beam," or "relativistic beam" technologies—laser, particle-beam, plasma beam, and related high-energy-density plasma phenomena propagating at or near the speed of light ("relativistically").

The following Special Report reviews the most advanced of these technologies for ABMs, which also represent the greatest potential revolution for industry and science beginning this decade. These technologies are the leading edge of a cultural mobilization to destroy the evil doctrine of mutually assured destruction, properly denounced by the President March 23, and to launch a new industrial/scientific revolution.



At the University of Rochester in New York State: prototype of the Omega laser now used to pump x-ray lasers.

Research or mobilization?

But there are clear indications the task force members are merely assessing various lines of successful R & D for incremental budget increases, rather than conceptualizing a crash program mobilizing American high-technology industrial and lab capabilities to achieve protection of the country against missiles at the earliest possible point.

A crash program is the only program that will work, for two overriding reasons. First, the Soviet leadership, which fears not ABMs as such but the technology race inherent in directed-energy ABM development, continues to act as if they *think* the new U.S. strategic doctrine can be reversed by a showdown. Andropov and company are in an incredibly dangerous "flight forward," to try to rid themselves of President Reagan, his European and Japanese backers, and his new defensive-weapons doctrine. (See page 50.) A crash development program for beam-weapons, with the President "on the warpath" mobilizing American technological optimism around it, is the message Andropov needs to end the Euromissiles showdown by negotiation rather than brinkmanship.

Second, the U.S. economy is a shivering wreck, with 80,000 bankruptcies in four years of Federal Reserve Chairman Volcker, and underlying technological obsolescence and rot long before that. The country's high-technology industrial mobilization capabilities are hanging by the slim thread of the federal defense budget, in the aerospace and related industries and the national labs. Unless that mobilization button

is pushed fast and hard, using advanced energy-beam technology development in depth as the "science driver" for an economic recovery, it will be futile to try to develop a mere R&D line of directed-energy anti-missile weapons.

Keyworth, the U.S. Joint Chiefs of Staff, and other military spokesmen publicly insist that, for the President, defensive weapons are a new strategic doctrine across the board, transforming all questions of weapons and weapons negotiations. Naval Chief of Operations James Watkins said recently in a New York speech, "The whole purpose of the President's new vision is to defend our people *and* our allies." Watkins estimated that 25-40 percent of Soviet defense spending is now for strategic and civil defense. The Russians are building extremely large new "Pushkino" phased-array radars for ABM tracking, and Watkins asserted that they are building new ABM *sites* at new missile launch silos—"some of the key elements [of ABM defense] are now deployed."

'Defense in depth'

Laser industry representatives were told May 17 by DOD Directed Energy Office head Maj. Gen. Donald Lamberson, to produce for "a defense in depth . . . to engage the attacker at every opportunity with a layered series of systems. A single directed-energy weapon could be designed with the capability of negating large numbers of targets in a relatively short time"—here the demanded technology is the x-ray laser—and we "may find lasers engaging hundreds of missiles in boost phase as the first layer of a ballistic missile defense-in-depth, and then particle beam weapons engaging a large fraction of the surviving reentry vehicles in mid-course phase."

A directed-energy weapons crash program will require very high power lasers in the near-infrared and visible-light spectrum, raising the challenge of developing lasers powered by nuclear fission reactions—light, launchable, and very energy-dense relative to chemical or similar laser pumping-power sources. It will require high-power, very high-frequency lasers in the ultraviolet and x-ray spectrum, for multiple, instantaneous "shock" disabling of missiles in the boost phase. FEF's Steven Bardwell demonstrates that the x-ray laser, which underwent its second series of successful underground proof-of-principle tests in April, may be not decades but a few short years away as an ABM system. We will require high-power "relativistic" electron and other particle beams for terminal-stage defense, and an understanding of electromagnetic pulse (EMP).

The greatest and most versatile advances of all may come from the free electron laser, which can be generated now from the self-amplifying combination of a relativistic electron beam and a beam of laser light.

Each step up the spectrum of greater frequency, intensity, and tunability of coherent radiation, is another potential revolutionary jump in human productivity, and another set of crucial advances in fusion power development, plasma physics, and science.