

# X-ray Laser Budget Grows as Public Information Declines

*A senior Energy Department official demands "a general lowering of the program's visibility," to the embarrassment of his boss, Secretary John Herrington*

At a time when nuclear bomb-driven weapons are beginning to assume a greater role in the "Star Wars" effort, the Reagan Administration is taking aggressive steps to reduce their public visibility. Through the classification of certain budget documents, an official admonition against the release of information that is merely considered "sensitive," and the development of a new policy for handling press inquiries, the Department of Energy (DOE) is apparently trying to clamp down on leaks about the scope and achievements of the nuclear explosive research program.

The program, which was to consume nearly \$300 million this year, is expected soon to receive an infusion of \$76.4 million in funds taken from other "Star Wars" accounts. An Administration proposal to this effect was given to Congress in early March. Next year, according to Administration plans, it is slated for at least a 50% funding increase, and in fiscal year 1988 at least a 27% increase. If these funds are approved, the program will be enlarged to more than 30% of the directed energy weapons effort, and more than 10% of the overall "Star Wars" or Strategic Defense Initiative (SDI) effort.

One indication of the DOE's anxiety about publicity for this growing scientific enterprise is provided by an unusually blunt letter, dated 23 January, from Major General George Withers, Jr., a deputy assistant energy secretary who manages all nuclear weapons research, development, testing, and production. The letter,\* which was addressed to Roger Batzel, the director of Lawrence Livermore National Laboratory (LLNL), says that "we do not believe the discussion of nuclear directed energy weapons concepts during media interviews is in the best interests of the Department of Energy, LLNL, or the national SDI pro-

gram. . . . Involvement by the DOE and the nuclear weapons laboratories in the SDI program has received more media attention than we believe is prudent. Even unclassified interviews which focus on nonnuclear programs can inadvertently lead to questions and responses which highlight the laboratory's nuclear SDI role. For that reason, we believe a general lowering of the DOE program's visibility is appropriate."

The letter, which according to officials has scotched several media visits to the lab, was defended by one DOE spokesperson in Washington, Jean Pruitt, who said that the intention was to "prevent things from getting into the press that are not in the interest of the national defense." But Anson Franklin, the director of DOE's Office of Communications, disagreed, and told *Science* that it was "badly worded, wrong and inconsistent with department policy." Speaking for DOE Secretary John Herrington, Franklin said that the agency's "policy is that there should be complete access to public information."

The Administration has taken a variety of additional steps to constrain public inquiries, however, arousing concern by some congressmen and scientists. In January, for example, Herrington said that all requests for "sensitive" information must be immediately reported by DOE employees and contractors to senior officials. "Sensitive" information is defined somewhat ambiguously as "unclassified data requiring a degree of protection due to the risk and magnitude of loss or harm that could result from inadvertent or deliberate disclosure." Since late 1984, DOE contractors have also been forced to inform DOE officials of inquiries from national "media," and to submit for "advance review" any plans and activities for the "media." A new policy is also being developed to coordinate all DOE interviews and statements more closely with those at the Pentagon's SDI office.

The Pentagon itself last month classified as "secret" a detailed General Accounting Office report on SDI programs, including

the nuclear explosives research effort, that was drawn entirely from unclassified sources. Secretary of Defense Caspar Weinberger explained that it is the "most comprehensive, official document on SDI," and that it was classified because its collection of unclassified budget and program information forms a "mosaic" that might be used by hostile intelligence forces "to project when critical technologies might be available to support development of defensive systems."

This last effort has drawn protests from Senators William Proxmire (D-WI), Lawton Chiles (D-FL), Mark Andrews (R-ND), and J. Bennett Johnston (D-LA), who are concerned that it might stifle public debate. Similarly, the letter from Withers has aroused concern at the University of California, which technically manages the Livermore lab under contract to the government. William Frazier, the university's senior vice president for academic affairs, told *Science* that the letter, which was brought to his attention by unhappy lab employees, was "obviously a matter of concern to us, as any policy that seeks to restrict the flow of information would be. We want to see the public and press well-informed, not misinformed, about the laboratory's activities." He said that he planned to raise the issue in Washington, and that it would also be discussed by an academic and scientific advisory committee appointed by the university's president and headed by Frederick Reines, a physicist at the University of California at Irvine. "This is a fundamental matter, on which the university simply can't compromise its standards," he said.

The controversy comes in the midst of an ambitious effort by the labs to increase sharply the brightness of the x-ray laser, one of several nuclear-driven directed energy weapons under development, and a series of squabbles over the way the program should be run (*Science*, 8 November 1985, p. 646, and 22 November 1985, p. 923). Livermore scientists hope to narrow the field of alternative x-ray laser concepts early next year, in preparation for a key laboratory experiment in 1988 and a key underground test before 1991. The ultimate goal, according to testimony by Richard Wagner, the assistant to the secretary of defense for atomic energy, last year before a closed session of the House Armed Services Committee, is to achieve a "million times enhancement" of brightness established as a benchmark by a panel of weapons experts convened in 1983 under the direction of James Fletcher.

Wagner's testimony indicates that, with sufficient funding, the goal might be met in 5 years, and a useful weapon might be available in "the near-term," which he defines as "a decade or two" from now.

\*The letter was signed on Withers' behalf by Richard Hahn, an associate director of DOE's military applications office. Both Hahn and Withers declined to comment.

Roughly \$60 million of the new funds sought for this year are to be transferred from the Pentagon to DOE, presumably for one or more underground tests in Nevada, beyond the two to four tests already scheduled for this fiscal year at a cost of \$157.8 million. In fiscal year 1987, the underground testing account will jump to \$226 million, or enough for three to five explosions. (The budget for underground testing of the weapons has exceeded that for laboratory research for several years.) In addition to the x-ray laser, a variety of nuclear-driven weapons such as particle beams, microwaves, hypervelocity pellets, and optical lasers are also under investigation and may eventually be tested.

"These nuclear power sources, if you want to consider them that way (they are explosions but they act as power sources)," may ultimately be unnecessary for a ballistic missile defense, Wagner testified. But "the first stages of the SDI program, which . . . may last decades, I believe and the Department believes will have this nuclear component, this new kind of nuclear-driven directed energy weapon as one of its very important options." ■ R. JEFFREY SMITH

## Briefing:

### New Shuttle Director Promises Emphasis on Safety

A new emphasis on safety will be the hallmark of the space shuttle's operations when flights resume, according to Rear Admiral Richard Truly, the new associate administrator for space flight at the National Aeronautics and Space Administration (NASA). Speaking on 25 March before an enthusiastic crowd at the Johnson Space Center in Houston, Texas, Truly outlined a series of activities that he said are "required to establish a realistic and achievable launch rate that will be safely sustainable."

Specifically, the entire budget and program management "philosophy, structure, reporting channels and decision-making process will be thoroughly reviewed," he said. All shuttle components considered vital to the safety of the orbiter and the crew will be reassessed, as will all waivers of engineering redundancy. Inspection and test requirements will be reviewed, and the booster joints, widely recognized to have been the cause of the shuttle accident in January, will be redesigned under the direction of the Marshall Space Flight Center in Huntsville, Alabama.

In addition, new launch criteria will be established at the outset, Truly said. "When it's time for the first flight, we are going to do it as safely as possible. We are going to launch in the daytime from Kennedy [Space Center in Florida], we're going to have a conservative flight design, [and] we're going to have a repeat payload, one that we have experience with." No civilians will fly during the first year, and all flights will occur in warm weather, he indicated.

Truly explained that the rules are necessary to restore the agency's credibility in the wake of the Challenger disaster (*Science*, 28 March, p.1495). The agency's present plan is to conduct roughly nine flights a year, beginning a year from now. First priority will be given to launching military satellites, as well as a tracking and communications satellite destroyed by the accident. "We cannot print enough money" to make the flights risk-free, Truly added. "But we certainly are going to correct any mistakes that we may have made in the past, and we are going to get going again just as soon as we can." ■

R. JEFFREY SMITH

### Panel Sees Decline in Undergraduate Education

A National Science Board committee report says that the nation's undergraduate programs in science, mathematics, and engineering "have declined in quality and scope to such an extent that they are no longer meeting national needs." This poses a "grave, long-term threat to the nation's scientific and technical capacity, its industrial and economic competitiveness, and the strength of its national defense," the panel warns.

On the basis of evidence gathered in its inquiry, the committee pinpointed three areas that require highest priority attention.

■ Laboratory instruction was described as "often uninspired, tedious, and dull." Instrumentation and facilities were found to be obsolete and inadequate—the need for new instruments was put at \$2 billion to \$4 billion.

■ Faculty members in too many cases were seen as unable to maintain their teaching skills, currency in their disciplines, and command of new technology. Serious shortages of qualified faculty were noted in some disciplines.

■ Courses and curricula were described as "frequently out-of-date in content, unimaginative, poorly organized for students with different interests, and (they) fail to reflect recent advances in the understanding of teaching and learning."

According to the report, institutions of all types in all regions of the country are affected. The problems of engineering disciplines were said to be most serious.

The committee was formed last May to assess the state of undergraduate education in science, mathematics, and engineering and make recommendations on the role the National Science Foundation should take in improving it. Its chairman was Homer A. Neal, provost of the State University of New York at Stony Brook. The committee reported to the National Science Board, which is the policy-making body for the foundation.

In its recommendations, the committee said that NSF lacks the resources to solve the problems itself, but should take a leadership role in stimulating the states and the private sector to increase their investment in undergraduate science, engineering, and math education. The panel does recommend that NSF expenditures in the field be increased by \$100 million a year in "leveraged" program support. Some \$5.5 million for college instrumentation is the only program in undergraduate education in the NSF budget this year. NSF director Erich Bloch is charged with converting the committee recommendations into proposals to be incorporated in next year's NSF budget. ■

JOHN WALSH

### Nuclear Meltdown: A Calculated (and Recalculated) Risk

For years, the nuclear industry has been trying to persuade the government to see a silver lining in the cloud that gathered over Three Mile Island. Broadly, the argument is that the 1979 nuclear accident was much less dangerous than official risk estimates would have led people to expect. Therefore, the risk studies should be rewritten. Eventually, if analysis confirms what the accident at Three Mile Island suggested, safety regulations may be adjusted to reflect a calmer view of what would happen in a meltdown.

An exercise of this kind has begun at the Nuclear Regulatory Commission (NRC), called the "source terms" review (*Science*, 5 April 1985, p. 31). The phrase refers to mathematical terms used to calculate leakage from radioactive sources. This project was inspired by the fact that radiation escaping from Three Mile Island was only a fraction of what might have been expected. Also, radioactive iodine was less volatile during the accident than many had predicted. Rather than venting to the atmosphere in a pure