whose costs are not paid in part by state governments.

OMB claims that its new proposal is more egalitarian because there is less variation among universities in the overhead they claim for faculty salaries. It also says there have been extensive negotiations with the universities since the original rules were proposed, and argues that the new proposal is a compromise based on these talks.

University groups are not happy, however. According to Carol Scheman of the Association of American Universities, which represents the presidents of some 50 leading research universities, the new proposal was never part of the negotiations. She says the cost of the proposal will be substantially more than the $100 million claimed by OMB.

The new rules are scheduled to take effect on 1 July 1987, although there is a provision that would allow individual agencies to implement them sooner if they elect to. They would apply only to new grants. ■

COLIN NORMAN

GAO Backs Decision to Conduct X-ray Laser Test

A new report by the General Accounting Office (GAO) confirms a series of reports last fall that equipment problems have hampered tests of the x-ray laser, an important element of the ongoing "Star Wars" missile defense research program. But the report, prepared at the request of the House Armed Services Committee, diminishes the seriousness of the problems and says that scientists working on the laser were justified in conducting a controversial recent x-ray laser test.

The test, conducted at the U.S. underground nuclear test site in Nevada on 28 December with an estimated cost of $30 million to $50 million, was sharply criticized by more than 30 congressmen who claimed that the equipment problems would render it useless. Press reports indicated that some of the scientists associated with the program shared this view. Subsequently, GAO investigators visited Lawrence Livermore National Laboratory, where most of the x-ray laser work is conducted, and conferred with officials at the Los Alamos and Sandia national laboratories, the Strategic Defense Initiative Office, and the Department of Energy (DOE) headquarters in Washington. They also contacted members of JASON, a group of independent physicists who regularly advise the Pentagon on nuclear matters.

In the end, they concluded that "in our opinion, there was no need to delay the latest x-ray laser nuclear test." It is true, they added in the report on 2 June, that in several past tests, problems with diagnostic equipment were serious enough to generate false impressions of the laser's performance. "Absolute power calculation inaccuracies occurred," the GAO said, as critics alleged. But some of the equipment was "reconfigured," and "these unexpected measurement uncertainties are now much better understood."

Necessarily, the GAO report is vague about the exact nature of the diagnostic difficulties, as well as the present status of the highly classified x-ray laser program. "Essentially, we found . . . a research program with many unresolved issues," it said. But it does provide some previously undisclosed information about the manner in which the performance of the laser is assessed, and about the views of independent scientists familiar with the program.

Specifically, the report says, Livermore scientists look at five laser beam properties: time of onset, total power, color, divergence, and duration. "The measurement of these properties is a difficult task because of the nuclear environment and the high intensity, short time scale of the lasing process," the accounting office was told by DOE.

The measurements are made by a variety of high-resolution spectrometers and imaging instruments, which record such things as the temporal shape of the laser beam and "detailed atomic physics of laser materials." A difficulty is created by the fact that "the high-intensity laser pulse interacts strongly with the measuring device[s] during the time of observation," DOE said. (Specifically, oxygen impurities in the experimental apparatus lased at the same frequency as the bomb-generated weapon, sources say.)

Despite the uncertainties created by this phenomenon, all of the program's official reviewers agree "that x-ray lasing has been demonstrated," DOE added. "We know of no example where a major scientific concern was not fully considered prior to the planning or execution of an underground test or major experiment." GAO said that while their review did not cover every test, "we have no knowledge about the program that would cause us to question the accuracy of DOE's response." Some participants in the program, as well as outside peer reviewers, had offered "constructive criticism," the GAO said, and "identified problems or issues which must be addressed." But DOE has taken their advice and "overall [these] individuals generally support the current . . . program."

Finally, the GAO report notes that funding for the x-ray laser research effort has increased dramatically in the past year (*Science*, 11 April, p. 152), and reports DOE's latest justification: a need to assess the threat that such lasers might pose to space-based missile defenses "at the earliest possible date." Representative Edward Markey (D–MA), one of the program's chief critics, says that he is unhappy about the ambiguity of some of DOE's unclassified statements, but that he is now satisfied that the decision to go ahead with the December test was a legitimate scientific "judgment call." ■

R. JEFFREY SMITH

EPA Reduces Penalty Against Biotech Firm

The Environmental Protection Agency on 6 June reduced the penalty imposed on a California biotechnology company for conducting an unauthorized experiment outdoors with altered microbes designed to inhibit frost formation on plants. The agency also dropped a charge that the company had "falsified" experimental data and instead faulted the company for "inadequate reporting."

The company, Advanced Genetic Sciences in Oakland, got itself into hot water when EPA discovered in February that it had conducted an outdoor experiment with the microbes without federal approval. And, according to EPA, the company led the agency to believe that the tests had been performed in a greenhouse, which prompted the agency to charge it with falsifying data.

In the unauthorized experiment, the company injected the modified bacteria into trees on the firm's rooftop to test their potential plant pathogenicity. The company did the experiment in applying for an EPA permit to conduct a small-scale field test of the bacteria.

EPA originally proposed to fine the company a maximum penalty of $20,000, but has cut it to $13,000. The reduction of penalties is common after negotiations with a violator, according to John Neylan, director of EPA's office of compliance, which is part of the office of pesticides and toxic substances. The company did not think the test constituted a deliberate release experiment, he said in an interview. "We felt that in reviewing matters, the company didn't knowingly falsify data. It was inadvertent. That's a judgment call." He added, "We felt there was a good faith effort that the company was acting decently in trying to correct problems." The company plans to reapply to conduct the field test. ■ MARJORIE SUN