

Advisory Board's subpanel on nuclear power, warns that Congress and industry must be careful in tinkering with the remains of the civilian research budget. "The main point of our panel findings so far is that we must resolve the problems for light-water reactors—both institutional and technical."

Otherwise, says Landis, who also serves as senior vice president of Stone and Webster Engineering Corporation, "there is no sense spending one dime on advanced reactors."

The budgetary upheaval touches a broad range of nuclear research activities, including the department's atomic vapor laser isotope separation (AVLIS) program for enriching uranium. The agency proposes to wind down research activities aimed at producing the next generation of enrichment equipment to enable the United States to stay competitive with foreign suppliers. DOE wants private industry to commercialize the technology, but industry officials are skeptical. "There is not going to be someone that will come forward with \$850 million on additional research on a process they are not sure will work," says EEP's Mills.

Laboratory operations such as those at Oak Ridge National Laboratory also would be hard hit. Fred R. Mynatt, director of nuclear and engineering technologies at ORNL, says 270 people working in fuel reprocessing and in liquid metal and gas-cooled reactor research will be laid off in 1987. Similarly, John E. Nolan, director of the Hanford Engineering Development Laboratory, says 240 jobs will be lost due to the decline in civilian nuclear research.

The militarization of DOE's nuclear program, says ANEC's Price, runs deeper than just shifts in research budgets. He contends that DOD should be bearing \$30 million in charges for operating, construction, and equipment expenses of research facilities that now are part of a \$121.8-million charge in the civilian nuclear R&D budget.

The intermingling of civilian and military nuclear research programs and budgets, says Price, must be stopped. Defense activities should be placed in a separate budget function, so the Congress is not misled about the actual level of civilian nuclear research and the costs of military programs. But the prospects for getting restitution for facilities operating costs or core nuclear research programs this year appears slim, industry officials concede. Says one Senate Appropriations Committee staffer, "The possibility of raising any one level more than a trifle is near impossible. This is an election year and there are less than 80 [working] days left for Congress." Faced with this uncertainty, industry lobbyists in Washington are pursuing a strategy of damage control for 1987. ■

MARK CRAWFORD

Briefing:

Biotech Firm Gets Another Black Eye Over Experiment

Advanced Genetic Sciences (AGS), the small California company that wants to conduct what would be the first field test of a genetically modified microbe, has shot itself in the foot again. The *Washington Post* disclosed recently that the company injected the bacteria into trees located outside on the rooftop of its Oakland laboratory without the knowledge or approval of the Environmental Protection Agency. News of the tests has brought more woes to AGS, EPA, and the industry as a whole as they grapple to develop a regulatory process governing the environmental release of biotech products.

Although the altered organisms, *Pseudomonas syringae* and *P. fluorescens*, are generally regarded by scientists and regulators as innocuous, Jeremy Rifkin, an author and activist, seized upon the disclosure of the tree tests as evidence that government regulations in biotechnology are inadequate, and that AGS and the industry cannot be trusted. The news prompted a federal judge to postpone a decision in a suit brought by Rifkin related to the AGS proposed experiment. In addition, a House subcommittee scheduled a hearing on the tests for 4 March.

The publicity about the tree tests is another blow to AGS, whose public image has taken a beating lately. In December, the company finally won permission from EPA and state authorities to field-test the bacteria, modified to prevent frost formation, on a one-tenth-acre strawberry patch in Monterey County. But community protests against the test erupted because, by AGS's own admission, the company failed to educate the local residents about the experiment (*Science*, 14 February, p. 667).

It was EPA that requested the tree tests in order to determine the potential of the modified bacteria to cause disease in several species. But the agency thought the tests would be conducted indoors. According to John Bedbrook, head of research at AGS, the trees were tested outside because they were too large to fit in the company's greenhouse. Bedbrook asserts that the experiment was contained because the altered bacteria were confined to a syringe and then injected into the bark of the trees. He says that no bacteria escaped. Steven Schatzow, head of the pesticides program at EPA, says, however, that the company violated agency rules and simply should have used smaller trees that would have fit in the greenhouse.

In any event, the experiment, which lasted 4 months, demonstrated that the modified microbes did not cause disease, according to Bedbrook and EPA. Although there have been press reports giving the impression that the trees injected with the modified organisms developed canker, Bedbrook and an EPA official pointed out in interviews that canker developed only in control trees that were injected with a pathogenic strain of the same microbial species. Bedbrook said that at the end of the experiment, the inoculated branches were autoclaved as a precaution.

Rifkin has also charged that the company's greenhouse was inadequate to contain the bacteria and that the windows of the laboratories were open during some of the indoor experiments. Bedbrook says that the company was vigilant. Greenhouse plants, for example, were sprayed or injected with the altered microbes in a Plexiglas container. After they were transferred out of the box, adjacent plants in the greenhouse were monitored to see if the bacteria moved from one plant to another. The tests were negative, Bedbrook says.

News of the tree test came a few days before a scheduled court hearing related to the AGS experiment before the U.S. District Court for the District of Columbia. After EPA approved the experiment last fall, Rifkin asked the court to halt the test, faulting the agency's decision on procedural grounds. But it is doubtful Rifkin can win because he must prove that the agency made an "arbitrary and capricious" decision. The agency spent more than a year reviewing the case and brought in an outside panel of scientists to review the experiment. Judge Thomas Hogan said he intended to rule in the first week in March. ■ MARJORIE SUN

Bloch Pares '86 NSF Grants Across the Board

The National Science Foundation, facing a \$34-million budget cut under the Gramm-Rudman-Hollings deficit reduction act, has decided to trim the size of individual grants rather than cut the number of awards it will make in fiscal year 1986.

The decision was outlined in a statement signed by NSF director Erich Bloch on 13 February. The message, however, appears to have been slow to get out. When Bloch mentioned it on 26 February at a meeting of 300 invited guests at a National Academy of Sciences gathering on the federal budget outlook for research, it produced howls from academics. They complained it could