

for arms control. Fortner is confident that some of his group's skills can be applied in fields ranging from optical electronics to environmental clean-up. Nevertheless, "I basically told 15% of my group that their job this year was to find a new job," he says.

At Los Alamos, some of the engineers and scientists in the testing program are hoping for a future in environmental monitoring. They are converting monitors once placed downwind of an explosion at the Nevada Test Site into what they hope will be a web of unattended environmental sensors around the world. The proposed network, known as GEONET, would connect thousands of the lunar lander-like sensors by satellite. "We need to be doing exciting work like this to keep people interested," says Jake Pera, testing group leader. "If we're not moving out and distributing these things around over the next 4 years, the program will die."

But not every manager will succeed in saving his or her program. Alan Spero had been a weapons designer and the deputy director of Lawrence Livermore's "A" division, which designs H-bombs, until he left in July to become a division leader in the analysis division, focusing on proliferation issues. Spero divides his former fellow designers into two categories: those who are "product-oriented" (there to build bombs), and those who are interested in physics. "Product-oriented people tend to feel the loss, and they're moving out," he says. "People are clearly getting the message that nobody cares anymore about what they did."

For Wood, the government's decision to stop testing has left her with a feeling of betrayal. "I, and others who have been here a lot longer than I have, have committed our lives to supporting national defense," she says. "Now we're being told, 'No thank you, we don't need you anymore.'" Many scientists say that the real effect of Clinton's decision won't be felt for many years. "In 10 years the nation won't have anybody with direct experience anymore," Spero says. And that can't be good for the program, adds Mercer-Smith: "Any discipline that stops doing advanced development is dead. The question is, 'How much does it have to stink before you bury it?'"

Joe Greene doesn't want to find out. Greene, 57, spent 30 years at Los Alamos in various parts of the weapons testing program, but the prospect of ending his career amid increased bureaucracy and declining quality was too much to bear. He's taking the early retirement offer in November, before the full implications of the lab's forced non-nuclear approach to nuclear weapons research hits home. "Many of my friends in the testing

program are going through hell, trying to maintain a sense of validity and their professional standards," he says. Another who is leaving is Stephen Kiergan, a 53-year-old Lawrence Livermore designer who hopes to fulfill a lifelong dream of teaching high school physics. Weapons designers "are facing a lot of turmoil" in the next

few years, he says. "I had to ask myself if I wanted to go through all that, only to retire a few years later."

#### A future without bombs

Indeed, the turmoil facing the weapons program seems likely to persist for several years. "I can't imagine a scenario that could get us back into testing," says Lawrence Livermore weapons designer Joe Sefcik. "I'm pretty much resigned to ending my career without testing."

Working on that assumption, lab officials are frantically trying to preserve knowledge

**"Now we're being told, no thank you, we don't need you anymore."**

**—Merri Wood**

## SUPERCONDUCTING SUPER COLLIDER

### Senate Vote Lifts Prospects for SSC

Scientists and workers at the site of the partially completed Superconducting Super Collider (SSC) clustered around television sets last week, watching the Senate decide the fate of their project. They let out a big cheer when the final vote came in: 57 to 42 to keep the project alive for at least another year. The vote overturned a death sentence imposed by the House of Representatives in June. And the relatively large margin of victory gives the project a good chance of surviving the congressional budget-cutting this year when members of the House and Senate meet in conference to iron out their differences on the SSC and other Department of Energy (DOE) projects.

Most construction remains halted at the Waxahachie, Texas, site of the SSC, however, and it is not likely to resume until the project's 1994 funding is assured, SSC officials say. Hundreds of lab employees were laid off and tunnel-digging suspended (*Science*, 30 July, p. 539) after the House voted earlier this year to kill the project, and the Texas legislature decided to withhold its annual \$79 million contribution until the political picture cleared. Texas has still not released those funds, and does not plan to revisit the issue until a meeting on 20 October of the Texas National Accelerator Laboratory Commission. "At the moment, we're still in a holding pattern," says lab spokesman Russ Wylie. Lab officials estimate that the delay could cost several million dollars.

of how to design a nuclear weapon before any more researchers like Greene and Kiergan retire or walk away. Unfortunately, little documentation exists on how to design, make, and test nuclear weapons. "Most of the critical information is transmitted by oral tradition," says Mercer-Smith. As a result, he and some of his colleagues may be spending the next few years madly typing as they try to record how to build bombs before they forget.

Why don't they just lock their desks and walk away? The answer lies deep in the psyches of those who have devoted their lives to what they believe is a noble calling. "Sure nuclear war is lousy," says Wood, "but so is conventional war. We have shown considerable restraint over the past 40 years. Why should people hypothesize that we'll show no restraint in the future?"

In the end, says Mercer-Smith, a moratorium on testing doesn't change the reason he came to Los Alamos. "If you really think you're here to save the world, it doesn't matter if you're having a good time or not," he says. "I know we're going to have a bad time, but we will still be here to save the world."

**—Christopher Anderson**

The project's fate now rests in the hands of a House-Senate conference committee, which will be made up of the congressional leadership and members of the appropriations committee—a group that favors building the SSC. Representative Jim Slattery (D-KS), a vocal opponent, circulated a letter last month calling for the conference committee to include members opposed to the SSC, but his petition was signed by fewer than half of the 280 representatives who voted no in June.

Congressional staffers say that the conference committee could meet as early as this week, although no final decision had been made at press time. DOE officials expect the project to emerge from the conference committee with the amount—\$640 million—the president requested and the Senate approved. Slattery and other House opponents such as Representative Sherwood Boehlert (R-NY) are not yet willing to call it quits, however. They will attempt to defeat the entire \$22 billion energy and water appropriations bill (which includes the SSC) when it is brought to the House floor after the conference. "We want to keep the pressure on the Speaker [of the House] to abide by the House's position" on the SSC, as reflected by its June vote, says Slattery aide Joel Shapiro. He concedes, however, that it may be difficult to get a majority of the House to reject the bill simply to kill the SSC.

**—Christopher Anderson**