

Science's Role in Shake-Up of DOE Lab

Citing "unacceptable" safety problems and a management culture that favored science over safety, Energy Secretary Federico Peña announced late last week that he was terminating Associated Universities' contract to run Brookhaven National Laboratory. Associated Universities, a nonprofit research organization with trustees from 26 universities, has managed this renowned Department of Energy science facility on Long Island since Brookhaven opened its doors in January 1947.

Among the problems cited is a reactor's fuel storage pool that has been leaking water containing low concentrations of radioactive tritium into the soil for an estimated 10 years. Although the leak, discovered last January, is on the facility's grounds, residents of the area are outraged.

Peña announced the unprecedented change in management—his first major policy decision since taking office a month ago—during a visit to the Upton, N.Y., laboratory on May 1. He also released a 50-page evaluation of Brookhaven's environmental and safety conduct and pledged to overhaul immediately the lab's administration and federal oversight of it.

At Peña's request, for instance, the Environmental Protection Agency began a full inspection of the lab this week. In addition, Martha Krebs, director of DOE's Office of Energy Research, has been charged with creating an "action plan" within 30 days to strengthen DOE's oversight of all its national laboratories. Peña admitted that the agency shares much of the blame for the attitudes that allowed safety and environmental protection problems to develop at Brookhaven because it did not maintain sufficiently close oversight of Associated Universities or make the contractor directly

accountable for safety.

Said Peña, "I'm sending a message to [the residents of] Long Island—and to our facilities nationwide" that "there need not—and will not—be a trade-off between award-winning scientific research and environment, safety, [or] health."

Some of the 250 scientists who had been using the lab's High Flux Beam Reactor (HFBR) are likely to see things differently. Their research may have to be abandoned if cleaning up low-level radioactive contamination depletes the reactor's operating budget.

HFBR, the most heavily used U.S. basic science facility for neutron studies, was shut down for routine maintenance last December. Days before it was to restart, the lab found the tritium leak.

In response to a public uproar, the lab's managers said the reactor would remain closed down while they assessed the situation. Last week, Krebs said that even though the shutdown "is a very significant loss [to science]," whether it reopens now hinges on finances.

The pledged cleanup of the tritium leak

during the next 2 years is expected to cost \$25 million. Lining the fuel storage pool with stainless steel—a further measure under discussion—could cost \$10 million more. Brookhaven's \$400 million budget might not stretch to pick up these costs and still finance reactor operations, says lab spokeswoman Mona S. Rowe.

At a press conference on the Brookhaven announcements, a reporter noted that the scientists who use HFBR "weren't at fault" and asked if DOE would help them find the money to move their work to reactors elsewhere. Krebs responded that it's too early to say.

DOE Assistant Secretary Tara O'Toole argued that "it is wrongheaded to say the users were not at fault." Users created an environment at Brookhaven that prompted a technician to do electrical repairs on live circuits—and risk electrocution—rather than shut down an experiment, she continued.

"The main message here," said O'Toole, "is that the users do have [a] responsibility for environment, safety, and health." —J. Raloff

Yeast make berry sweet sugar substitute

A new study sweetens the future of a protein-based sugar substitute, providing a way for it to be manufactured commercially. Called monellin, the protein is 3,000 times sweeter than sugar and 15 times sweeter than aspartame.

First isolated by scientists at the Monell Chemical Senses Center in Philadelphia in 1972, monellin comes from a very sweet, orange-red berry native to West Africa. In the May NATURE BIOTECHNOLOGY, Keiji Kondo and his colleagues at the Kirin Brewery Co. in Kanagawa, Japan, report that they have genetically engineered yeast to produce monellin in large quantities.

Monellin accounts for up to 50 percent of the water-soluble proteins in the yeast, concentrations rivaling those in the berries themselves. "To get that much is quite encouraging," says Monell biochemist Joseph Brand. The Kirin scientists also developed a simple method of purifying the protein, an important advantage for industrial production.

One problem with protein-based sweeteners such as monellin is that heat or acidic conditions cause them to break down, drastically limiting the kinds of foods to which they can be added. Monellin consists of two separate protein strands that wrap around each other, forming a configuration that binds well to taste receptors (SN: 5/19/90, p. 315). "If

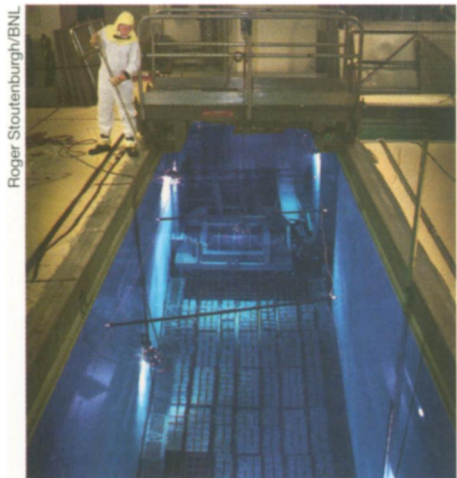
you destroy the shape, you destroy the sweetness," Brand explains.

Previous work by Sung-Hou Kim and his colleagues at the University of California, Berkeley showed that connecting the strands together at one end makes monellin much more stable without affecting its flavor. The Kirin researchers engineered the yeast to make this more stable version of monellin.

Moreover, the scientists employed a strain of yeast that's harder to work with than the others in laboratory use, Brand says, but they made that choice for practical reasons. "The yeast itself has been approved as a food additive [by the Food and Drug Administration]," says Kondo, "so it is considered to be a suitable host for production of proteins."

Thaumatococcus, another protein-based sweetener from a West African fruit, has been available in food products in Japan and Europe for more than a decade. So far, no one has successfully produced it in microorganisms. Although it has the same sweetness as monellin, "thaumatococcus is very expensive," Kondo says.

Drinkers of imported beer probably won't find monellin in bottles of Kirin anytime soon. Although the technology is promising, Kondo says, it will probably take many years for monellin to leap the high regulatory hurdles set for food additives. —C. Wu



Leaking used-fuel storage pool.