

from the prevailing statutory scheme.”

DOE, as the owner of Yucca Mountain, was expected to challenge the ruling, but the three-judge appeals panel was unanimous, and several congressional observers said the assumption on Capitol Hill is that the ruling will stand. If the court ruling does stand, the solution lies in Congress’s changing the law to be consistent with the 10 000-year standard the EPA is using. None of the parties involved is advocating a radiation standard based on containment for hundreds of thousands of years or more.

Not an easy vote

“This is a real problem that the advocates don’t know how to get around,” said a congressional staff member who follows the issue. “The way around it is passing a law that says it’s okay to use the 10 000-year standard, but that’s not going to be an easy vote up here.”

One of Yucca Mountain’s chief advocates, Senator Pete Domenici (R-NM), said that if the decision stands, “the ramifications are enormous. It may go well beyond Yucca. It may be the end of the nuclear industry.”

But with Kerry on record against

the project, and Nevada lawmakers in both the House and Senate opposed to the Yucca Mountain repository, the odds of passing a relaxed radiation standard are not high. That is especially true in an election year when Nevada is considered a swing state in play for both Democrats and Republicans.

The problems relating to Yucca Mountain are not limited to the court ruling. A budgeting disagreement between the White House and Representative David Hobson (R-OH), chairman of the energy and water subcommittee of the House Committee on Appropriations, has resulted in a drastic cut in the fiscal year 2005 budget for Yucca Mountain.

The administration wants \$880 million for the facility in FY 2005, but to keep the overall budget numbers down, it submitted a budget request of only \$131 million. The Office of Management and Budget (OMB) proposed that the remaining \$749 million should come from fees paid into the nuclear waste fund—a multibillion-dollar fund contributed by the nuclear industry over many years to cover the cost of storing radioactive waste.

The dispute arose because the nu-

clear waste fund exists only on paper. The money that the nuclear industry pays goes into the general fund and is not set aside for radioactive waste costs. So the OMB proposal to “re-classify” nuclear waste fees so they could be used for Yucca Mountain means \$749 million would be taken from the general treasury. Thus far, Congress has balked.

“OMB played Russian roulette when they assumed the House and Senate would pass the proposed reclassification language,” Hobson said. Other lawmakers described the OMB plan as “muddled” and a “budget gimmick.” Legislation has been introduced to authorize the OMB reclassification, but its prospects are uncertain. Should the House reverse course and authorize \$880 million for Yucca Mountain, the prospects for quick action—or any action—in the Senate prior to the presidential election are not good.

Congressional staff members and other observers expect that a continuing resolution will be passed to keep funding Yucca Mountain at FY 2004 levels until both the court case and funding dispute can be resolved.

Jim Dawson

US Physics Teachers Volunteer in AIDS-Ravaged Zambia

With a small grant and a good idea, a group of Virginia physics teachers is working in a remote area of Zambia to prevent physics education from becoming a victim of the AIDS pandemic.

About 50 kilometers down a dirt road in southern Zambia, more than 600 girls aged 12 to 20 live and attend classes at the St. Joseph’s Girls’ Secondary School. A third of them are HIV/AIDS orphans in a country hit hard by the disease. The pandemic is also ravaging the country’s teaching corps—about 20% of Zambia’s teachers have HIV/AIDS. They are dying at a rate of about 1000 per year, faster than they can be replaced.

When circumstances at the school permit, the girls study physics. Calculators are rare, computers are even rarer, and labs with equipment to run experiments are almost nonexistent. But the girls have to learn classical mechanics, electricity and magnetism, and a host of other topics in the physical sciences to pass their state-mandated exams. Fail, and their formal education ends.

It is into this world that a handful of high-school physics teachers from Virginia have stepped, in what they describe as a “grassroots” effort to

keep physics alive in Zambian schools. They’ve chosen St. Joseph’s school, which they describe as being “in the middle of nowhere,” as their base of operations because, despite its problems, it is one of the best schools in the southern African nation.

The US teachers are working with a four-year, \$50 000 grant from Hampton University’s Physics Frontier Center, an NSF-funded educational program under the umbrella of the Center for the Study of the Origin and Structure of Matter. Part of the COSM mandate is education and outreach, which is the emphasis of the Hampton program. The university, in Hampton, Virginia, is one of the oldest schools centered on education for African Americans.

The teachers began the project last summer by conducting two weeks of workshops for physics teachers at a handful of Zambian schools. “The people we’re doing these workshops with are the people who are going to be out there in front of those class-

rooms with the physics, chemistry, and math students,” said Charles Tisdale, a retired US Navy nuclear reactor operator who teaches physics at Princess Anne High School in Virginia Beach. “We’re thinking global, but we’re acting local in the sense that we’re trying to get down and do something in Zambia that’s going to make a difference. And it is also paying off as a reward to us.”

An education collaboration

Described as “a collaboration in education,” the COSM project began when Ken Cecire, an education specialist at Hampton, led the five physics teachers, three NASA scientists, and a teacher from Marymount International School in Rome to the St. Joseph’s school. After workshops with Zambian teachers at St. Joseph’s, the group conducted workshops at two other Zambian schools: St. Mary’s High School in Livingstone and the Kabulonga Boys High School in the capital city of Lusaka.

Cecire and several of the teachers were back in Zambia last month for three weeks of workshops to begin implementing a four-year physics cur-



Hank Horn, a former high-school physics teacher from Virginia, helps Zambian teachers set up equipment for a physics experiment last summer at St. Rafael's High School in Livingstone, Zambia.

riculum that, by 2007, will cover measurements, classical mechanics, waves, light, sound, electricity and magnetism, and modern physics. "We're looking at two things," Cecire said. "On one level, we're working with teachers, trying to help them out, because in fact their ranks have been reduced by the AIDS crisis. But the underlying issue is Zambia's economic development." Last year, a student told one of Cecire's teachers, "We'll handle the AIDS crisis. What we really need you to do is something about developing this country."

"Without physics and mathematics,

teachers to develop lesson plans and simple lab experiments. Just as in the US, Cecire said, few physics teachers in Zambia have degrees in physics. Most are the product of two-year training schools, and they teach in the classic lecture style that was established before 1964, when Zambia was a British colony.

"One of the reasons they do that is because there are no textbooks," said Maria Niland, whose experience with the Zambian students in 2001 actually led to the Hampton program. "There are about 40 kids in a class and there is very little equipment, so there

that's an awfully hard job," Cecire said. "Hopefully, what we're doing is helping teachers bring up a generation of students that become leaders, and who have the science background to change some things for the better in their own country."

Last summer, the group worked mostly with Zambian physics

is not much ability to do anything else." Without a lot of training, she said, the "easiest thing to do is write notes on a board. The teachers usually have a copy of some textbook, and the students copy it and memorize it."

Professional development for the teachers is made all the more critical by the HIV/AIDS pandemic, she said. "It is really taking a toll on the teaching force, not only in terms of teachers dying, but teachers having to cover more than one class, and teachers teaching while they are very sick." Because of that reality, she said, the workshops focused on low-cost hands-on activities "so that it's less teacher centered and more student centered."

A serendipitous beginning

The Hampton program is the result of a serendipitous chain of events that began about a decade ago when Niland, having just completed her senior thesis on health-care policy in prison systems, was doing AIDS education and health-care work in North Carolina prisons.

Many inmates told Niland that they wished they'd worked harder in school

MAGNETS

COMPLETE DESIGN FACILITIES • NEODYMIUM IRON BORON
SAMARIUM COBALT • CERAMIC • ALNICO • MOLDED/BONDED RARE EARTHS
ELECTROMAGNETS • MAGNETIC ASSEMBLIES



With a state of the art manufacturing facility which is certified to ISO 9001:2000 we can deliver a quality magnet, assembly or sub assembly **fast**. MCE can also fully engineer and design a solution for your magnet requirement. Call or FAX us with your requirement for an **immediate** quotation.



MAGNETIC COMPONENT ENGINEERING, INC.

2830 Lomita Blvd. • Torrance, CA 90505

Toll Free: (800) 989-5656

Main: (310) 784-3100 • Fax: (310) 784-3192

Email: sales@mceproducts.com • Website: www.mceproducts.com

RGA+Ion Gauge+Pirani
Residual Gas Analyzer Plus.....

Extorr



- *Three gauges on a single probe with a 2 3/4" flange.
- *A small, powerful control package drives the probe.
- *RS232 connection to your computer.
- *Complete operation under Extorr windows software.
- *Immediate startup using the built-in Pirani gauge.
- *Automatic ion gauge operation.
- *Automatic residual gas analyzer operation.
- *Continuous monitoring protects the filament.
- *All is recorded. All is protected. All is monitored.
- *Autoranging, high stability, and high sensitivity.

Three gauges in one extraordinary package.

Extorr is an outstanding vacuum measurement value.

100 amu for \$3450 (U.S. list)

Extorr Inc.
307 Columbia Road
New Kensington, PA 15068
Tel 724-337-3000 Fax 724-337-8322

Our Website is
www.extorr.com



Maria Niland and Hank Horn pose with students and faculty from the University of Zambia during last year's trip.

and that high school was actually too late for them. "I decided I needed to explore that more, so I went back and got my first master's degree in education so I could teach." She ended up at an inner-city school in Newport News, Virginia, where the principal saw she had a background in math and science "and told me what I was going to teach. I very quickly became the head of the science department."

Niland met Cecire when both were teaching at an NSF summer program to help middle- and high-school physics teachers. That experience led her to do summer research at the nearby Thomas Jefferson National Accelerator Facility and at NASA's Goddard Space Flight Center in Greenbelt, Maryland. After five years in the Newport News school system, she was offered a staff position in the education department at Jefferson Lab.

"After a couple of years there, I missed the classroom, so I put my résumé on the internet," Niland said. Officials at the Marymount International School, run by Catholic nuns, offered her a job teaching high-school physics. She landed in Rome and soon was involved in the school's outreach program in Africa. In 2001, Niland found herself in Zambia teaching math at a school for deaf, blind, and disabled middle- and high-school students.

"It was a phenomenal experience," she said. While there, she visited St. Joseph's Girls' school. The students, daughters of government officials and other elite families, had only cold showers and ate the same thing every day, Niland said. Despite its good reputation, she said, the school was "minimal."

"I made a lot of friends with these students, and when you teach students you end up loving them and they become very near and dear to you." After returning to the US, she showed Cecire the letters she was receiving from the girls. "I said, 'Ken, you're working at Hampton University, this storied black college. There must be some kind of Africa outreach.'" Cecire read the letters and, a week later, called Niland.

ing program for US teachers. "We told them what we wanted to do, what we were interested in, and asked who wanted to join in," Cecire said. Three Virginia physics teachers, Tisdale, Lewis Fowler of Centreville High School in Clifton, and Henry Horn, who had been a physics teacher at West Springfield High School, volunteered to help. This year, two other teachers, Charles Merriam of Norfolk Academy and Joseph Fehr of Centreville High School, joined the group.

Differences and similarities

What immediately struck Horn was the enthusiasm of the Zambian students. "They sit down and listen," he said. "They are really excited about learning. When we went last year, there was a teachers' strike and students were coming up to the school and sitting in classrooms by themselves, waiting for someone to come in and teach them. You don't find that in US schools."

Fowler was struck by the similarities between Zambian and US students. The Zambian teachers, he said, "have

the same problems with their students that we have with ours—understanding concepts, behavior-type things. Even though these kids want to learn, they have problems focusing, just the same thing we see in our schools."

The US teachers also reassessed their own teaching based on what they saw in Zambia. "I'd gotten so involved with all of the technology we have, the computers and high-tech equipment, that I was losing sight of the physics," Fowler said. "So I simplified. Based on what I saw and learned over there, I went back to the basics and I think my kids came away with a better understanding of physics."

Cecire and Niland said they would like to expand the program and send young US math and science teachers to the Zambian schools. "We'd like to try to, in some way, help alleviate, or mitigate, the effects of the AIDS pandemic on the teaching force," Niland said. "We're not trying to take jobs away from Zambian teachers, but at this time, where they are having such dramatic teaching shortages, this is a way of keeping up the quality of the education."

But any thoughts of expanding the program are "based on hypothetical funding," Cecire said. For the moment, Niland said, "We want to keep our heads down and just stay focused on our own little portion. We're not trying to change the world. We're just trying to help out our fellow physics teachers."

Jim Dawson

Los Alamos Halts Work in Wake of Apparent Security Breach

Blaming the 7 July disappearance of two classified computer disks on a few employees flouting rules, on 15 July Los Alamos National Laboratory Director G. Peter Nanos called for a complete stand-down, or work stoppage, at the lab. "Critical missions and essential functions," relating mostly to the lab's stewardship of the nation's nuclear weapons, are the only exceptions. A couple of weeks later, Energy Secretary Spencer Abraham broadened the stand-down for activities involving classified removable electronic media, or CREM, to all Department of Energy sites.

Then, in mid-August, reports circulated that the supposedly missing disks never existed. Citing an FBI investigation, the reports, which first surfaced on a New Mexico television station and

which neither LANL nor the FBI would confirm at press time, said there was a mix-up in accounting for bar codes, not actual classified material.

LANL's future is threatened, Nanos told employees in mid-July—before the existence of the disks had been thrown into question. He vowed "to hold those involved fully accountable, up to and including termination of employment, if appropriate." Moreover, he added, "if one of the cowboys at Los Alamos who think that the rules don't apply to them goes off and does something stupid, you can just kiss the University of California goodbye. . . . People in Washington just don't understand how any group of people that purports to be so intelligent can be so inept." UC has managed the lab since its inception