

PROFILE

Rebottling the Nuclear Genie

Information warrior Thomas B. Cochran is fighting hard against U.S. reliance on nuclear weapons

Thomas B. Cochran is gazing intently at his computer screen, paging through hundreds of targets for a planned nuclear attack on Russia. The individually named and numbered strategic sites are organized by category: antiballistic-missile radars, launch-control centers, submarine docks, silo fields. Speaking quietly with a Tennessee twang, he apologizes for not yet having the exact geographical coordinates of all the missile silos—he's working on that. But he has the boundaries of the silo fields. And as a leading authority on nuclear weapons and official adviser to the Department of Energy, which oversees the nuclear stockpile, he also has a pretty clear idea which warheads to use against each target. "Infor-

mation is extremely important in this business," he observes dryly.

Cochran is senior scientist and director of the nuclear program at the Natural Resources Defense Council, where for almost 20 years he has used aggressive political pressure tactics—information warfare of a sort—to reduce the U.S.'s reliance on nuclear weapons. "The people on Capitol Hill aren't going to pay any attention to you until they read about you in the *New York Times* or *Scientific American*," he says pleasantly. "So you litigate to get publicity."

The plan is to make a list of nuclear targets that matches as closely as possible the Pentagon's own highly classified list. "We think they reduced the target list last December from about 11,000

to about 2,000 in Russia and 500 elsewhere," Cochran notes. At the same time, he drops the first name of the National Security Council officer who drafted new "guidance" on targeting and points out that it explicitly allows the military to target nonnuclear weapons of mass destruction. Cochran and his associates Christopher E. Paine and Matthew G. McKinzie plan to use their homegrown target database to model the effects of different war scenarios, so they will have better information to aim new campaigns, like strategic warheads, at the DOE. "It will show the absurdity of keeping the number of weapons we keep," Cochran declares.

He also litigates to block the executive branch from deviating from statutes already on the books. His record—extraordinary by any standard—is grounded in technical analysis: Cochran's degrees are in physics and mathematics, not political science. Frank von Hippel, a nuclear weapons expert at Princeton University, says Cochran broke new ground in the 1970s, when, while working for the think tank Resources for the Future, he published a damning analysis of the Clinch River Breeder reactor project, a huge government program to develop a reactor that would create more fuel than it consumed. The government's logic "was based on several key assumptions, none of which turned out to be correct," Cochran recounts gloomily. "It was a total loser." Cochran fought the reactor on economic and environmental grounds for 12 years, until Congress canceled the scheme in 1983. "You have to be ready to stay the course," Cochran advises would-be activists.

Cochran "has extraordinary chutzpah," von Hippel remarks. "He is willing to take on what most people wouldn't bother with because they assume it's hopeless." And despite Cochran's even demeanor, he is quite capable of making "unvarnished statements," says von Hippel, who has served as a government official and been on the receiving end of some of Cochran's assessments of "idiotic" executive branch decisions.

The DOE now puts Cochran on its advisory committees, but if the aim is to soften his tough stance against the agency it does not seem to be working. The government scientist in charge of the National Ignition Facility, a giant laser-fusion device under construction at Lawrence Livermore National Laboratory, initially sought Cochran's approval for the plan. Cochran declined to give it



KATHERINE LAMBERT

GERMANIUM GAMMA-RAY DETECTOR
was used by Thomas B. Cochran on a Soviet warship to show that such devices can identify warheads and so verify arms treaties.

and eventually sued the DOE, challenging its decision to set up a committee at the National Academy of Sciences to advise on the project.

The committee, Cochran recalls shaking his head, was stacked with people with close economic ties to the DOE's weapons program and to Lawrence Livermore. Yet it had been asked to give a judgment on whether the machine should be built. A well-connected lawyer friend of Cochran's made short work of that arrangement in court last year, using an open-government statute. As a result, the DOE is not allowed to consider that committee's work.

The National Academy of Sciences went into shock at the prospect that it might have to open up all its committee meetings to the public. In response to the contretemps, Congress hurriedly passed legislation that allows independent groups such as Cochran's to comment on the makeup of academy committees advising the government. The compromise also opens up to the public such committees' fact-finding sessions.

Cochran and his associates are now negotiating with DOE lawyers to settle a broader legal assault on the DOE's Stockpile Stewardship and Management Program, which the National Ignition Facility supports. The government says the program aims to ensure that nuclear weapons remain safe and reliable even though none have been tested since 1992. Cochran charges, however, that the program is actually intended to give the U.S. the capability to design new and more effective nuclear weapons. The DOE is working hard at developing supercomputers 100,000 times faster than today's machines. These devices, Cochran judges, will be able to simulate the explosion of the "physics package" in a warhead with unprecedented precision, from first principles of physics. The \$4.5 billion to \$5 billion being spent every year on the program is vastly more than necessary for the relatively simple job of keeping the existing stockpile safe and reliable, Cochran asserts. He says that of the other nuclear states, only France is in a position to pursue a similar course.

If Cochran is correct, the purpose of the stockpile stewardship program rests uneasily with the administration's stated policy of not developing new nuclear weapons. At least one new weapon has arrived already, Cochran points out. The recently introduced B61-11, a ground-penetrating warhead has crucial military advantages over its nonpiercing prede-

cessor, the B61-7, Cochran states, even though the physics package is similar. Yet the DOE, as a semantic decoy, calls the B61-11 a mere modification.

The stockpile stewardship effort has ballooned because of political pressure from the weapons laboratories, Cochran charges. So he is unapologetic about dogging the program with a lawsuit brought under the National Environmental Policy Act, which requires comprehensive environmental impact statements for major projects. The same action challenges the lack of an environmental impact statement for cleanup efforts at the DOE's weapons laboratories.

Cochran does his homework. Half the floor of his office is taken up with 40 fat ring binders containing 1,600 documents on the DOE's environmental studies. Cochran the information warrior says he has looked through all of them. And he and his colleagues have



ANTIBALLISTIC-MISSILE SITES
around Moscow would likely be among the first targets destroyed in a nuclear attack on Russia.

other irons in the fire as well. Cochran has a particular interest in opposing commerce in weapons-usable material such as plutonium and highly enriched uranium and in maintaining scientific contacts with other nuclear powers.

In 1986 he made headlines when he took 20 tons of seismic-measuring equipment to the then Soviet Union's main nuclear test site in Kazakhstan to monitor shock waves from tests. Soviet scientists later came to monitor testing at the Nevada site. The project was startling for the degree of cooperation the Soviets offered. It got under way when von Hippel set up a meeting in which Cochran presented his plan to Evgeny P. Velikhov, a vice president of the Soviet Academy

of Sciences. Velikhov, who was close to then Soviet President Mikhail S. Gorbachev, "immediately saw the political implications," Cochran tells.

The project demonstrated the feasibility of utilizing seismic monitoring to verify a low-threshold test ban. It was later taken over by the government and earned Cochran the American Physical Society's Szilard Award. The American Association for the Advancement of Science also acknowledged the project by giving the Natural Resources Defense Council its Award for Scientific Freedom and Responsibility.

In the late 1980s Cochran led another U.S. team that used radiation detectors near a live warhead on a Soviet cruiser, to prove the detectors could verify arms-control limits.

On this visit he flew around the Soviet Union in the minister of defense's private plane. Cochran also escorted congressional delegations to sensitive Soviet military installations, such as the Krasnoyarsk early-warning radar in central Siberia.

Now Cochran is trying to pull off the same trick in China. He says he has developed "good relations" with a number of influential figures

in the Chinese nuclear weapons program, including Hu Side, head of the Chinese Academy of Engineering Physics, and his deputy Du Xiangwan. Both are "very strong arms-control advocates," Cochran insists. An international group of physicists now meets with Chinese weapons experts every couple of years to discuss arms control and environmental policy, Cochran reports. He says the U.S. government has never asked him to acquire specific information, although he has been "informally debriefed" after some foreign visits.

Von Hippel says Cochran's early activism has served as a model for other environmental groups. Most have now realized that they must master the technical complexities of their subject to be taken seriously in policy circles. For those who would emulate his career trajectory, Cochran cites some advice he heard about propaganda: "Always tell the truth. Always make understatement. And talk to your enemies."

—Tim Beardsley in Washington, D.C.